

2009

# Supplemental and Obsolescence Digest 175



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**Circuit Breaker Covers**

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**Air Conditioning Disconnects**

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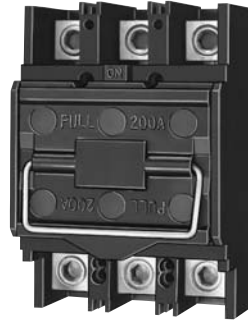
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**Class T Fusible Pullouts**

- 2- or 3-pole fusible pullouts
- 200 A maximum 300 V Class T fuses (not included)
- 1Ø3W 120/240 V  
1Ø2W 240 V
- 3Ø3W 240 V delta  
3Ø4W 240/120 V delta  
3Ø4W 208Y/120 V
- UL Listed 100 kA short circuit current rating



FTL2200



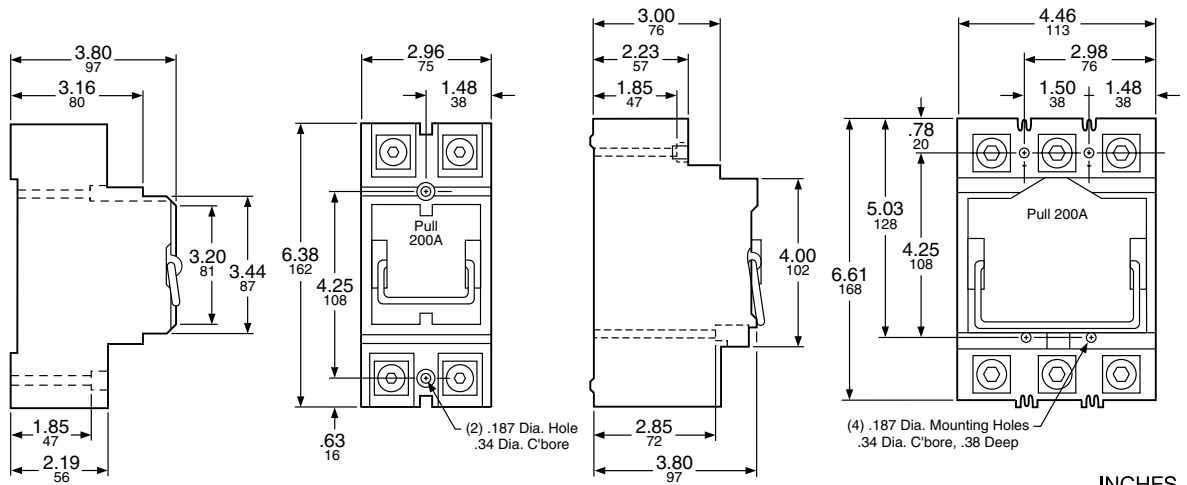
FTL3200

**Table 1.1: Fusible Pullouts**

Mains		Two-pole		Three-pole		Main Wire Size AWG/kcmil	Fuse Pullout Only	\$ Price
System	Rating	Cat. No.	\$ Price	Cat. No.	\$ Price	Al or Cu		
1Ø3W 120/240 V 1Ø2W 240 V	100 A	FTL2100▲	380.00	—	—	4–250	4050704950▲	128.00
	200 A	FTL2200▲	400.00	—	—		4050703850▲	151.00
3Ø3W 240 V delta 3Ø4W 240/120 V delta 3Ø4W 208Y/120 V	100 A	—	—	FTL3100	1000.00		4050707050▲	196.00
	200 A	—	—	FTL3200	1045.00		4050705950▲	288.00

▲ Not stocked in PDS. Order point Lexington.

**Dimensions**



Dual Dimensions: INCHES  
Millimeters



## Circuit Breaker Covers

Refer to Catalog 1100CT0501

### Circuit Breaker Covers

Available now from Square D / Schneider Electric are two different versions of rainproof circuit breaker covers which are UL component recognized as being suitable for use as breaker handle covers.

They are constructed of durable impact-resistant material and are intended for use by OEMs where a rainproof cover is needed (e.g. on heat pumps and air conditioners with built-in disconnects). Both models have a built-in latch with padlock provisions.

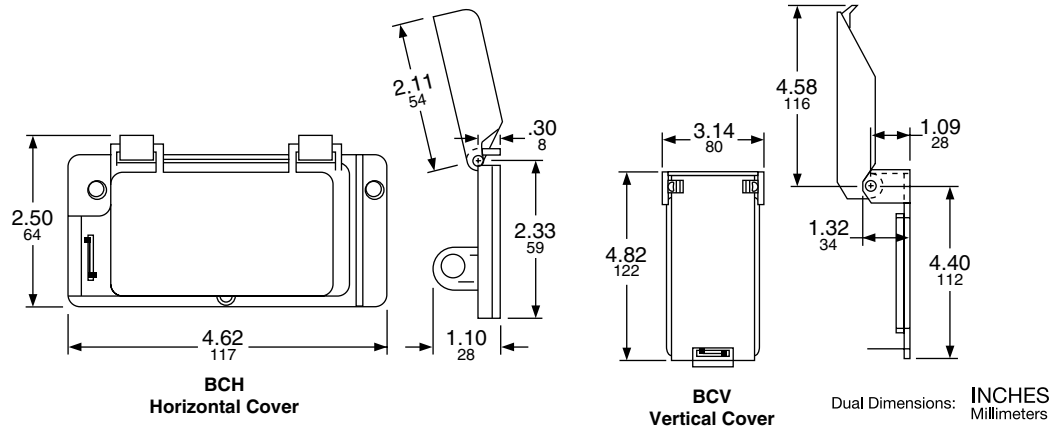
The BCH covers are for use on a horizontally-mounted circuit breaker and fit over Square D two-pole QO, QOU, Q2, EH and three-pole Q2 and EH circuit breakers.

The BCV covers are for use on vertically-mounted circuit breakers and will fit over Square D two and three pole QO, QOU, Q2, EH, FA and KA circuit breakers.

**Table 1.2: Covers**

Quantity	Cat. No.	\$ Price
1	BCH	20.50
1	BCV	20.50

### Dimensions



**Air Conditioning Disconnects**

LOAD CENTERS



**Table 1.3: Non-Fusible Air Conditioning Disconnect—Pullout**

Rainproof—UL Listed

Service	Ampere Rating ▲	Metallic		Non-metallic		Max. Hp
		Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2 Wire—240 Vac Maximum</b>						
	60 A	UFP222R	170.00	UFP222RNM	191.00	10
<b>2 Wire—240 Vac Maximum—with 20 A GFI receptacle</b>						
	60 A	UFP222RGFI	455.00	—	—	10
<b>2 Wire—240 Vac Maximum—with 20 A duplex receptacle</b>						
	60 A	UFP222RD	260.00	—	—	10

**Table 1.4: Fusible Air Conditioning Disconnect—Pullout**

Rainproof—UL Listed

Service	Ampere Rating ■	Metallic		Non-metallic		Max. Hp
		Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2 Wire (Pullout and Fuseholder)—240 Vac Maximum</b>						
	30 A	FP221R	161.00	FP221RNM	191.00	3
	60 A	FP222R	161.00	FP222RNM	191.00	10

Note: Suitable for use as service equipment on 120/240 Vac 1Ø3 wire services if used only on a 1Ø2 wire load; and only when the equipment grounding terminal is replaced with ground terminal kit PK3GTA1. Price \$7.60.

**Dimensions**

**Table 1.5: Box Dimensions**

Cat. No.	H		W		D	
	in.	mm	in.	mm	in.	mm
QO200TR	6.50	165	4.63	117	3.88	98
QO200TRNM	8.75	222	6.50	165	3.88	98
UFP222R	7.50	191	5.25	133	3.25	83
UFP222RNM	8.75	222	6.50	165	3.88	98
FP221R	7.50	191	5.25	133	3.25	83
FP221RNM	8.75	222	6.50	165	3.88	98
FP222R	8.88	225	5.25	133	3.25	83
FP222RNM	8.75	222	6.50	165	3.88	98

- ▲ Does not contain overcurrent protection. Suitable for use on systems with up to 10 kA available fault current at 240 Vac max when protected by a fuse or circuit breaker rated 60 A or less.
- Suitable for use on systems with up to 10 kA available fault current at 240 Vac.

**NOTE:** For Repair and Replacement parts:

- Go to [www.schneider-electric.us](http://www.schneider-electric.us)
- Click on FAQ's
- Enter the device catalog number
- Click SEARCH
- Look for the information required.

**General Duty Safety Switches**

Field-Installable Class J Fuse Kit 2-2

Field-Installable Lug Kit 2-2

**Heavy Duty Safety Switches**

Electrical Interlock Kits 2-3

Phenolic Legend Plate 2-3

Push Button—Pilot Light—Selector Switch 2-3

Key Interlock Systems 2-4

Sample Applications 2-4

**Field-Installable Class J Fuse Kit**

The kit consists of three Class J fuse adapters as required for a 3P, fusible 600 A general duty switch.

Kit can be installed in field in 600 A series E3 switches only (NEMA 1).

**Table 2.1: Class J Fuse Kit**

Switch Rating (A)	Class J Kit Cat. No.	\$ Price
600 A Series E3	GDJK600	293.00

**Field-Installable Lug Kit**

Kit consists of three line, three load, and two neutral lugs as required for a 3P 400 A or 600 A general duty switch.

Kit can be installed in field on 400 or 600 A Series E3 switches.

**Table 2.2: Lug Kit**

Switch Rating (A)	Lug Kit Cat. No.	Wire Range/NEC 312.6 AWG/kcmil	Lug Wire Range per Lug AWG/kcmil	\$ Price
400 or 600 A Series E3▲	GD4060LK	(1) 1/0-600 or (2) 1/0-500 or (4) 1/0-250	(2) 1/0-600 or (4) 1/0-250	404.00

▲ Not applicable for use on the 400 A NEMA Type 3R General Duty Safety Switch.

**Electrical Interlock Kits**

Electrical interlocks for heavy duty 30–1200 A safety switches are available factory-installed or in kit form for field installation. Each kit contains instructions for proper field mounting. A pivot arm operates from switch mechanism, breaking the control circuit before the main switch blades break. Switches with electrical interlocks installed are UL Listed. For factory-installed electrical interlocks add EI (for one contact) or EI2 (for two contacts) suffix to catalog number.

**Table 2.1: Electrical Interlock Kit ▲**

Switch Rating	Series Number (See Digest Section 3)	Electrical Interlock Kit Cat. No. ■	\$ Price	Factory-Installed \$ Price
30 A	F1, F5–F7	EIK031◆★ EIK032◆★	145.00	239.00
	F3	EIK1 EIK2	207.00	301.00
60 A	F1-F3 F5–F7 (600 V)	EIK1 EIK2	207.00	301.00
	F4 F5–F6 (240 V)	EIK031▼ EIK032▼	145.00	239.00
100–200 A	F2–F7	EIK1 EIK2	207.00	301.00
400–1200 A	E1–E4	EIK40601 EIK40602	355.00	449.00

- ▲ See Digest Section 3 for electrical interlocks on NEMA 4X fiberglass reinforced polyester and Krydon®
- Electrical interlock kit catalog numbers with 1 suffix indicates one normally open and one normally closed contact; 2 indicates two normally open and two normally closed contacts. Kits are UL Listed. HU461AWK uses EK3061 or EK3062.
- ◆ The following series -F5–F7 devices use EIK-1,2: H3612, H3612A, H3612AWK, H3612RB, H461, H461DS, H461AWK, HU461, HU461DS, HU661DS, HU661AWK, H361AWA, H361AWC, HU361AWA and HU361AWC.
- ▼ H362WA, HU362WA, H362WC, H362AWA, HU362AWA, H362AWC, HU362AWC, and H2212AWK use EIK1 or EIK2 electric interlock.

**Table 2.2: Electrical Interlock Contact Ratings** ◆◆◆▼ :

Interlock Type	AC - 50 or 60 Hz				DC		
	Volts	Make	Break	Cont.	Volts	Make & Break	Cont.
<b>Cat. No. ending with a 1 utilize a 9007A01 limit switch.</b>							
1 NO/1 NC Contact	120	40 A	15 A	15 A	115	0.50 A	15 A
	240	20 A	10 A	15 A	230	0.25 A	15 A
	480	10 A	6 A	15 A	—	—	—
	600	8 A	5 A	15 A	600	0.05 A	15 A
<b>Cat. No. ending with a 2 utilize a 9007C03 limit switch.</b>							
2 NO/2 NC Contacts	120	30 A	3.0 A	10 A	115	1.0 A	10 A
	240	15 A	1.5 A	10 A	230	0.30 A	10 A
	480	7.5 A	0.75 A	10 A	—	—	—
	600	6.0 A	0.60 A	10 A	600	0.10 A	10 A

Note: Single pole single throw interlock kits are rated 1/2 hp @ 110 and 220 Vac.

**Phenolic Legend Plate**

Available engraved and mounted on all heavy duty safety switches, except NEMA 7 and 9. Legend engraved in 1/4 in. high white letters on black background. Customer must provide legend. UL Listed.

To order, add suffix NP to standard Cat. No.

Example: H363-NP

Price adder per legend plate—\$167.00

**Push Button—Pilot Light—Selector Switch**

Push buttons, pilot lights or selector switches are available factory-installed in the cover of NEMA 1, 3R, (4-4X-5) stainless steel or 12 heavy duty non-fusible safety switches and all double throw switches. Wiring to contact blocks is not available. Customer must furnish catalog number of push button, pilot light or selector switch device desired. UL Listed. Add suffix PB to switch catalog number. Order by description.

Price = Switch + push button, pilot light or selector switch + factory-installed adder.

Factory-installed price adder—\$584.00



### Key Interlock Systems

Factory-installed only on heavy duty safety switches and double throw safety switches.

Interlocks are used to prevent the authorized operator from making an unauthorized operation. Not available on hazardous location devices (NEMA 7/9) or fiberglass reinforced polyester (NEMA 4X).

The key interlock system is a simple and easy method of applying individual key interlock units and assemblies to the above equipment so as to require operation in a predetermined sequence. UL Listed.

#### Quoting:

Contact Schneider Electric for catalog number, availability and pricing prior to quoting a job.

#### Ordering:

Order cannot be released for production until the following information has been provided:

- End User—Company name, address;
- Function of each lock (e.g., switch to be locked open with key removed, key held when switch is closed);
- Existing Equipment—if switch is to be interlocked with equipment already on site, provide brand of existing lock and key number;
- Other New Equipment—if switch is to be interlocked with new equipment not yet installed at the site, then provide contact person and phone number so that locks may be coordinated
- Additional information may be required upon order entry;
- Schneider Electric locks supplied unless otherwise specified.

#### Use these suffixes on switch catalog numbers:

- KI1 = 1 lock per switch
- KI2 = 1 lock with 2 cylinders per switch
- KIKI = 2 separate locks per switch

Table 2.1: Price Adder Per Lock▲

Switch Type	\$ Price
30–1200 A Heavy Duty	2055.00
30–600 A Double Throw	1988.00

▲ Prices do not apply when more than three devices are interlocked as these schemes normally require more than one key assembly per device.

### Sample Applications

#### Sample Application—1

To prevent two devices from being closed simultaneously.

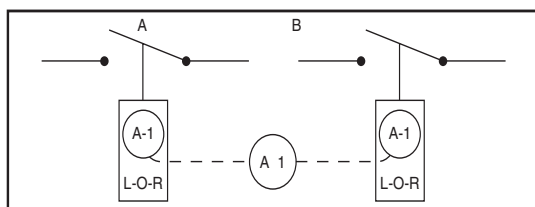


Figure 1

Two devices are shown in Figure 1. In operation they are not closed at the same time. With the interlocks arranged as shown only one key is required in the interlocking system. Both devices are shown open, therefore, the key is free. To close any one device the key is inserted and turned in that particular lock, the key is held in this lock until the device is again locked open. This simple interlocking sequence lends itself to a multitude of applications. The procedure is the same for two devices, neither of which is to be opened at the same time.

#### Sample Application—2

To prevent opening of switch A when circuit breaker B is closed.

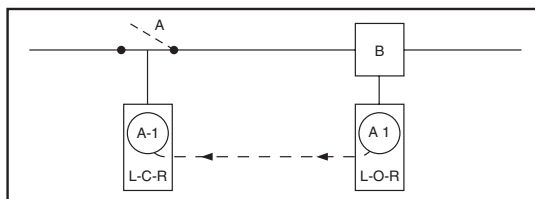


Figure 2



Switch A and circuit breaker B are in closed position. Key A-1 is held in circuit breaker B interlock.

1. Open circuit breaker.
2. Turn key A-1 in L-O-R interlock on circuit breaker B to lock open. Key A-1 is now free.
3. Insert key A-1 in L-C-R interlock on switch A and turn to unlock.
4. Open switch A. Key A-1 is now held. Reverse sequence to restore service.

#### Sample Application—3

To prevent operation of switch A when circuit breaker B is closed. Permits re-closing of circuit breaker for servicing when switch is locked open.

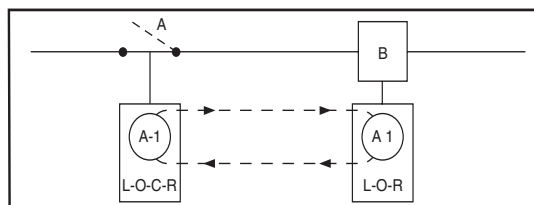


Figure 3

Switch A and circuit breaker B are in closed position. Key A-1 is held in circuit breaker interlock.

5. Open circuit breaker.
6. Turn key A-1 in L-O-R interlock on circuit breaker B to lock open. Key A-1 is now free.
7. Insert key A-1 in L-O-C-R interlock on switch A and turn to unlock.
8. Open switch A.
9. Turn key A-1 in L-O-C-R interlock on switch A to lock open. Key A-1 is now free.
10. Return key A-1 to circuit breaker interlock and unlock for operation during servicing period.

Reverse sequence to restore service.

#### Sample Application—4 (Main-Tie-Main)

To prevent paralleling of lines A and B.—Two loads, fed from either source.

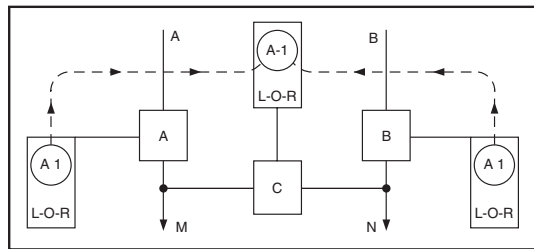


Figure 4

Circuit breaker A is closed to supply load M. Circuit breaker B is closed to supply load N. Tie-circuit breaker C is open. Keys A-1 are held in interlocks on both circuit breakers A and B. Tie-circuit breaker C cannot be closed unless either A or B is locked open.

To transfer load N to circuit breaker A, proceed as follows:

1. Open circuit breaker B.
2. Turn key A-1 in L-O-R interlock on circuit breaker B to lock open. Key A-1 is now free.
3. Insert Key A-1 in L-O-R interlock on tie-circuit breaker C and turn to unlock. Key A-1 is now held.
4. Close tie-circuit breaker C.
5. Reverse sequence to restore service.
6. Load M can be supplied through circuit breaker B in a similar manner.

### Locking Position—Designations

- Devices locked open with key removed
- Devices locked closed with key removed
- Devices locked open or closed with key removed
- Devices locked open with key held
- Devices locked closed with key held
- Devices locked open or closed with key held
- Multi-lock interlock (More than one key per lock)

### Diagram Symbols

#### Note:

Device locked open = switch in OFF (O) position  
Device locked closed = switch in ON (I) position

- Device normally open
- Device normally closed
- Direction of key transfer
- Key interchange number
- Key

## 03 Molded Case Circuit Breakers and Enclosures

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**NOTE:** Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.



FA 1P  
1.5 in. (38 mm)  
Mounting Height



FA 2P  
3 in. (76 mm)  
Mounting Height



FA 3P  
4.5 in. (114 mm)  
Mounting Height

**Table 3.5: F-Frame—100 A, Thermal-Magnetic, I-Line® Construction, 240 Vac, Standard Interrupting**

Ampere Rating	Fixed AC Magnetic Trip		2 P▲		3 P		Terminal Wire Range (AWG)
			240 Vac		240 Vac		
	Hold	Trip	Cat. No.	\$ Price	Cat. No.	\$ Price	
15 A	275 A	600 A	FA22015()	398.00	FA32015	572.00	AL50FA 14–4 Cu or 12–4 Al
20 A	275 A	600 A	FA22020()	398.00	FA32020	572.00	
25 A	275 A	600 A	FA22025()	398.00	FA32025	572.00	
30 A	275 A	600 A	FA22030()	398.00	FA32030	572.00	
35 A	400 A	850 A	FA22035()	398.00	FA32035	572.00	AL100FA 14–1/0 Cu or 12–1/0 Al
40 A	400 A	850 A	FA22040()	398.00	FA32040	572.00	
45 A	400 A	850 A	FA22045()	398.00	FA32045	572.00	
50 A	400 A	850 A	FA22050()	398.00	FA32050	572.00	
60 A	800 A	1450 A	FA22060()	398.00	FA32060	572.00	
70 A	800 A	1450 A	FA22070()	617.00	FA32070	780.00	
80 A	800 A	1450 A	FA22080()	617.00	FA32080()	780.00	
90 A	900 A	1700 A	FA22090()	617.00	FA32090	780.00	
100 A	900 A	1700 A	FA22100()	617.00	FA32100	780.00	

**Table 3.6: F-Frame—100 A, Thermal-Magnetic, I-Line® Construction, 480 Vac Standard Interrupting**

Ampere Rating	Fixed AC Magnetic Trip		Standard Interrupting						Terminal Wire Range (AWG)
			1P▲★		2P▲		3P		
			Hold	Trip	277 Vac, 125 Vdc		480 Vac, 250 Vdc		
				Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
15 A	275 A	600 A	—	—	FA24015()	651.00	FA34015	833.00	AL50FA (1) 14–4 Cu or (1) 12–4 Al
20 A	275 A	600 A	—	—	FA24020()	651.00	FA34020	833.00	
25 A	275 A	600 A	—	—	FA24025()	651.00	FA34025	833.00	
30 A	275 A	600 A	—	—	FA24030()	651.00	FA34030	833.00	
35 A	400 A	850 A	FA14035()	302.00	FA24035()	651.00	FA34035	833.00	AL100FA (1) 14–1/0 Cu or (1) 12–1/0 Al
40 A	400 A	850 A	FA14040()	302.00	FA24040()	651.00	FA34040	833.00	
45 A	400 A	850 A	FA14045()	302.00	FA24045()	651.00	FA34045	833.00	
50 A	400 A	850 A	FA14050()	302.00	FA24050()	651.00	FA34050	833.00	
60 A	800 A	1450 A	FA14060()	302.00	FA24060()	651.00	FA34060	833.00	
70 A	800 A	1450 A	FA14070()	332.00	FA24070()	833.00	FA34070	996.00	
80 A	800 A	1450 A	FA14080()	332.00	FA24080()	833.00	FA34080	996.00	
90 A	900 A	1700 A	FA14090()	332.00	FA24090()	833.00	FA34090	996.00	
100 A	900 A	1700 A	FA14100()	332.00	FA24100()	833.00	FA34100	996.00	

**Table 3.7: F-Frame—100 A, Thermal-Magnetic, I-Line® Construction, 600 Vac**

Ampere Rating	Fixed AC Magnetic Trip		Standard Interrupting						High Interrupting			Current Limiting				Terminal Wire Range (AWG)	
			2P▲		3 P		1P▲★		2P▲		3P		2P▲		3P		
			Hold	Trip	600 Vac. 250 Vdc	600 Vac. 250 Vdc	277 Vac, 125 Vdc	600 Vac. 250 Vdc	600 Vac. 250 Vdc	600 Vac. 250 Vdc	600 Vac. 250 Vdc	600 Vac. 250 Vdc	600 Vac. 250 Vdc	600 Vac. 250 Vdc	600 Vac. 250 Vdc		600 Vac. 250 Vdc
				Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
15 A	275 A	600 A	FA26015()	780.00	FA36015	971.00	FH16015()	507.00	FH26015()	1214.00	FH36015	1446.00	—	—	—	—	AL50FA 14–4 Cu or 12–4 Al
20 A	275 A	600 A	FA26020()	780.00	FA36020	971.00	FH16020()	507.00	FH26020()	1214.00	FH36020	1446.00	FI26020()	2763.00	FI36020	3296.00	
25 A	275 A	600 A	FA26025()	780.00	FA36025	971.00	FH16025()	507.00	FH26025()	1214.00	FH36025	1446.00	—	—	—	—	
30 A	275 A	600 A	FA26030()	780.00	FA36030	971.00	FH16030()	507.00	FH26030()	1214.00	FH36030	1446.00	FI26030()	2763.00	FI36030	3296.00	
35 A	400 A	850 A	FA26035()	780.00	FA36035	971.00	FH16035()	507.00	FH26035()	1214.00	FH36035	1446.00	—	—	—	—	AL100FA 14–1/0 Cu or 12–1/0 Al
40 A	400 A	850 A	FA26040()	780.00	FA36040	971.00	FH16040()	507.00	FH26040()	1214.00	FH36040	1446.00	FI26040()	2763.00	FI36040	3296.00	
45 A	400 A	850 A	FA26045()	780.00	FA36045	971.00	FH16045()	507.00	FH26045()	1214.00	FH36045	1446.00	—	—	—	—	
50 A	400 A	850 A	FA26050()	780.00	FA36050	971.00	FH16050()	507.00	FH26050()	1214.00	FH36050	1446.00	FI26050()	2763.00	FI36050	3296.00	
60 A	800 A	1450 A	FA26060()	780.00	FA36060	971.00	FH16060()	507.00	FH26060()	1214.00	FH36060	1446.00	FI26060()	2763.00	FI36060	3296.00	
70 A	800 A	1450 A	FA26070()	947.00	FA36070	1163.00	FH16070()	563.00	FH26070()	1452.00	FH36070	1632.00	FI26070()	2763.00	FI36070	3296.00	
80 A	800 A	1450 A	FA26080()	947.00	FA36080	1163.00	FH16080()	563.00	FH26080()	1452.00	FH36080	1632.00	FI26080()	2763.00	FI36080	3296.00	
90 A	900 A	1700 A	FA26090()	947.00	FA36090	1163.00	FH16090()	563.00	FH26090()	1452.00	FH36090	1632.00	FI26090()	2763.00	FI36090	3296.00	
100 A	900 A	1700 A	FA26100()	947.00	FA36100	1163.00	FH16100()	563.00	FH26100()	1452.00	FH36100	1632.00	FI26100()	2763.00	FI36100	3296.00	

▲ 1P and 2P circuit breaker catalog numbers are completed by adding the required phase connection letters as a suffix. See Phase Option Table.  
 ■ FCL 2P circuit breakers are built using 3P module.  
 ◆ FCL circuit breakers are not rated for 250 Vdc.  
 ★ Rated 277 Vac, 125 Vdc. 15–30 A circuit breaker suitable for use with 60°C or 75 °C conductors. 35–100 A circuit breakers are suitable for use with 75°C conductors.

**Table 3.8: Phase Options**

Phase Option Letter	1P	2P	3P
A	FA14035A		
B	FA14035B		
C	FA14035C		
AB		FA24030AB	
AC		FA24030AC	
BC		FA24030BC	
ABC			FA34030
CBA			FA34030CBA

**Table 3.9: Interrupting Ratings**

Voltage	FA			FH	FC▼	FI
	240 Vac	480 Vac	600 Vac			
240 Vac	10 kA	18 kA (1P), 25 kA (2P, 3P)	25 kA	25 kA (1P) 65 kA (2P, 3P)	—	200 kA
277 Vac	—	18 kA	—	—	—	—
480 Vac	—	18 kA	18 kA	25 kA (2P, 3P)	100 kA	200 kA
600 Vac	—	—	14 kA	18 kA (2P, 3P)	—	100 kA

▼ See Section 11.

Accessories ..... Page 3-26—3-28  
 Optional Lugs ..... Page 3-29—3-30  
 Dimensions ..... Page 3-35  
 Enclosures: see Digest Section 7

**NOTE:** Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.



KAL/KHL  
2P and 3P  
70-250 A



KIL36250



Q4L  
2P and 3P  
250-400 A

**Table 3.10: K-Frame—250 A, Thermal-Magnetic, Individually-Mounted, 600 Vac**

Ampere Rating	Adjustable AC Magnetic Trip▲		Current Limiting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	
<b>2P, 600 Vac, 250 Vdc</b>					
110	550 A	1100 A	KIL26110	6177.00	AL250KA (1) 4 AWG-350 kcmil Al
125	625 A	1250 A	KIL26125	6177.00	
150	750 A	1500 A	KIL26150	6177.00	
175	875 A	1750 A	KIL26175	6177.00	
200	1000 A	2000 A	KIL26200	6177.00	AL250KI (1) 1/0 AWG-350 kcmil Al
225	1125 A	2250 A	KIL26225	6177.00	
250	1250 A	2500 A	KIL26250	7223.00	
<b>3P, 600 Vac, 250 Vdc</b>					
110	550 A	1100 A	KIL36110	7754.00	AL250KA (1) 4 AWG-350 kcmil Al
125	625 A	1250 A	KIL36125	7754.00	
150	750 A	1500 A	KIL36150	7754.00	
175	875 A	1750 A	KIL36175	7754.00	
200	1000 A	2000 A	KIL36200	7754.00	AL250KI (1) 1/0 AWG-350 kcmil Al
225	1125 A	2250 A	KIL36225	7754.00	
250	1250 A	2500 A	KIL36250	9081.00	

**Table 3.11: Q4-Frame—400 A, Thermal-Magnetic, Individually-Mounted, 240 Vac**

Ampere Rating	Adjustable AC Magnetic Trip▲		Standard Interrupting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	
<b>2P, 240 Vac</b>					
250	1250 A	2500 A	Q4L2250	3171.00	AL400LA (1) 1 AWG-600 kcmil Al or (2) 1 AWG-250 kcmil Al
300	1500 A	3000 A	Q4L2300	3171.00	
350	1750 A	3500 A	Q4L2350	3171.00	
400	2000 A	4000 A	Q4L2400	3171.00	
<b>3P, 240 Vac</b>					
250	1250 A	2500 A	Q4L3250	3831.00	AL400LA (1) 1 AWG-600 kcmil Al or (2) 1 AWG-250 kcmil Al
300	1500 A	3000 A	Q4L3300	3831.00	
350	1750 A	3500 A	Q4L3350	3831.00	
400	2000 A	4000 A	Q4L3400	3831.00	

- ▲ UL magnetic trip setting tolerances are ±25% for low and ±20% for high from nominal value shown.
- KC circuit breakers are 480 Vac

**Table 3.12: Interrupting Ratings**

Voltage	KAL♦	KHL♦	KCL♦	KIL	Q4
240 Vac	42 kA	65 kA	100 kA	200 kA	25 kA
480 Vac	25 kA	35 kA	65 kA	200 kA	—
600 Vac	22 kA	25 kA	—	100 kA	—

♦ See Section 11.

Accessories ..... Page 3-26—3-28  
Optional Lugs ..... Page 3-29—3-30  
Dimensions ..... Page 3-35  
Enclosures: see Digest Section 7

**NOTE:** Consider using PowerPac<sup>®</sup> circuit breakers for situations requiring circuit breaker accessories.



KA/KH/KC 2P and 3P  
4.5 in. (114 mm)  
Mounting Height



KI 2P and 3P  
4.5 in. (114 mm)  
Mounting Height



Q4 2P and 3P  
6 in. (152 mm)  
Mounting Height

**Table 3.13: K-Frame—250A, Thermal-Magnetic, I-Line<sup>®</sup> Construction, 600 Vac**

Ampere Rating	Adjustable AC Magnetic Trip <sup>▲</sup>		Current Limiting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	
<b>2P, 600 Vac, 250 Vdc ♦</b>					
110	550 A	1100 A	KI26110( )	<b>6633.00</b>	AL250KA (1) 4 AWG–350 kcmil Al
125	625 A	1250 A	KI26125( )	<b>6633.00</b>	
150	750 A	1500 A	KI26150( )	<b>6633.00</b>	
175	875 A	1750 A	KI26175( )	<b>6633.00</b>	
200	1000 A	2000 A	KI26200( )	<b>6633.00</b>	AL250KI (1) 1/0 AWG–350 kcmil Al
225	1125 A	2250 A	KI26225( )	<b>6633.00</b>	
250	1250 A	2500 A	KI26250( )	<b>7704.00</b>	
<b>3P, 600 Vac, 250 Vdc</b>					
110	550 A	1100 A	KI36110	<b>8375.00</b>	AL250KA (1) 4 AWG–350 kcmil Al
125	625 A	1250 A	KI36125	<b>8375.00</b>	
150	750 A	1500 A	KI36150	<b>8375.00</b>	
175	875 A	1750 A	KI36175	<b>8375.00</b>	
200	1000 A	2000 A	KI36200	<b>8375.00</b>	AL250KI (1) 1/0 AWG–350 kcmil Al
225	1125 A	2250 A	KI36225	<b>8375.00</b>	
250	1250 A	2500 A	KI36250	<b>9267.00</b>	

**Table 3.14: Q4-Frame—400 A, Thermal-Magnetic, I-Line<sup>®</sup> Construction, 240 Vac**

Ampere Rating	Adjustable AC Magnetic Trip <sup>▲</sup>		Standard Interrupting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	
<b>2P, 240 Vac ♦</b>					
250	1250 A	2500 A	Q422250( )	<b>3435.00</b>	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
300	1500 A	3000 A	Q422300( )	<b>3435.00</b>	
350	1750 A	3500 A	Q422350( )	<b>3435.00</b>	
400	2000 A	4000 A	Q422400( )	<b>3435.00</b>	
<b>3P, 240 Vac</b>					
250	1250 A	2500 A	Q43250	<b>4313.00</b>	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
300	1500 A	3000 A	Q43300	<b>4313.00</b>	
350	1750 A	3500 A	Q43350	<b>4313.00</b>	
400	2000 A	4000 A	Q43400	<b>4313.00</b>	

▲ UL magnetic trip setting tolerances are ±25% for low and ±20% for high from nominal value shown.

■ KC circuit breakers are 480 Vac

♦ 2P and 3P circuit breaker catalog numbers are completed by adding the required phase connection letters as a suffix. See Phase Option Table.

**Table 3.15: Interrupting Ratings**

Voltage	KA★	KH★	KC★	KI	Q4
240 Vac	42 kA	65 kA	100 kA	200 kA	25 kA
480 Vac	25 kA	35 kA	65 kA	200 kA	—
600 Vac	22 kA	25 kA	—	100 kA	—

★ See Section 11.

**Table 3.16: Phase Options**

Phase Option Letter	2P	3P
AB	KA26250AB	
AC	KA26250AC	
BC	KA26250BC	
ABC		KA36250
CBA		KA36250CBA

Accessories ..... Page 3-26—3-28  
Optional Lugs ..... Page 3-29—3-30  
Dimensions ..... Page 3-35  
Enclosures: see Digest Section 7

**NOTE:** Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.



LAL/LHL MC  
For Mission Critical  
Power Loads  
available in 200, 225, 250,  
and 400 A @ 480 Vac

**Table 3.17: L-Frame—400 A, Thermal-Magnetic, Individually-Mounted, High Magnetic Withstand Circuit Breakers For Mission Critical Loads**

Ampere Rating	AC Magnetic Level Factory Set▲	Standard Interrupting		High Interrupting		Terminal Wire Range
		Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>LA/LH MC Circuit Breaker, 3P, 480 Vac</b>						
200 A	4000 A	LAL34200MC	4962.00	LHL34200MC	7941.00	AL250LA (1) 4 AWG–350 kcmil Al
225 A	4500 A	LAL34225MC	4962.00	LHL34225MC	7941.00	
250 A	5000 A	LAL34250MC	5355.00	LHL34250MC	8336.00	
400 A	8000 A	LAL34400MC	6615.00	LHL34400MC	9596.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al

▲ AC magnetic setting tolerances are +0–25% from max. value shown.

**Table 3.18: L-Frame—600 A, Thermal-Magnetic, Individually-Mounted Circuit Breakers, 600 Vac**

Ampere Rating	Adjustable AC Magnetic Trip		Standard Interrupting		High Interrupting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2P, 600 Vac, 250 Vdc</b>							
125 A	625 A	1250 A	LAL26125	3807.00	LHL26125	6362.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
150 A	750 A	1500 A	LAL26150	3807.00	LHL26150	6362.00	
175 A	875 A	1750 A	LAL26175	3807.00	LHL26175	6362.00	
200 A	1000 A	2000 A	LAL26200	3807.00	LHL26200	6362.00	
225 A	1125 A	2250 A	LAL26225	3807.00	LHL26225	6362.00	
250 A	1250 A	2500 A	LAL26250	3807.00	LHL26250	6362.00	
300 A	1500 A	3000 A	LAL26300	3807.00	LHL26300	6362.00	
350 A	1750 A	3500 A	LAL26350	3807.00	LHL26350	6362.00	
400 A	2000 A	4000 A	LAL36400	3807.00	LHL26400	6362.00	
<b>3P, 600 Vac, 250 Vdc</b>							
125 A	625 A	1250 A	LAL36125	4619.00	LHL36125	7598.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
150 A	750 A	1500 A	LAL36150	4619.00	LHL36150	7598.00	
175 A	875 A	1750 A	LAL36175	4619.00	LHL36175	7598.00	
200 A	1000 A	2000 A	LAL36200	4619.00	LHL36200	7598.00	
225 A	1125 A	2250 A	LAL36225	4619.00	LHL36225	7598.00	
250 A	1250 A	2500 A	LAL36250	4619.00	LHL36250	7598.00	
300 A	1500 A	3000 A	LAL36300	4619.00	LHL36300	7598.00	
350 A	1750 A	3500 A	LAL36350	4619.00	LHL36350	7598.00	
400 A	2000 A	4000 A	LAL36400	4619.00	LHL36400	7598.00	



LAL/LHL  
2P and 3P  
125–400 A

**Table 3.19: L-Frame—600 A, Current-Limiting, Individually-Mounted Circuit Breakers, 600 Vac**

Ampere Rating	Adjustable AC Magnetic Trip		Extra-High Interrupting		Current Limiting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2P, 600 Vac</b>							
300 A	1500 A	3200 A	LCL26300	7479.00	LIL26300	8604.00	AL600LI5 (2) 4/0 AWG–500 kcmil Al
350 A	1750 A	3200 A	LCL26350	7479.00	LIL26350	8604.00	
400 A	2000 A	3200 A	LCL26400	7479.00	LIL26400	8604.00	
450 A	2250 A	4200 A	LCL26450	7823.00	LIL26450	12551.00	
500 A	2500 A	4200 A	LCL26500	7823.00	LIL26500	12551.00	
600 A	3000 A	4200 A	LCL26600	7823.00	LIL26600	12551.00	
<b>3P, 600 Vac</b>							
300 A	1500 A	3200 A	LCL36300	8312.00	LIL36300	9563.00	AL600LI5 (2) 4/0 AWG–500 kcmil Al
350 A	1750 A	3200 A	LCL36350	8312.00	LIL36350	9563.00	
400 A	2000 A	3200 A	LCL36400	8312.00	LIL36400	9563.00	
450 A	2250 A	4200 A	LCL36450	8691.00	LIL36450	13949.00	
500 A	2500 A	4200 A	LCL36500	8691.00	LIL36500	13949.00	
600 A	3000 A	4200 A	LCL36600	8691.00	LIL36600	13949.00	



LIL36600  
2P and 3P 300–600 A

**Table 3.20: Interrupting Ratings**

Voltage	LAL	LHL	LCL	LIL
240 Vac	42 kA	65 kA	100 kA	200 kA
480 Vac	30 kA	35 kA	65 kA	200 kA
600 Vac	22 kA	25 kA	35 kA	100 kA

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Optional Lugs ..... Page 3-29–3-30  
Dimensions ..... Page 3-35  
Enclosures: see Digest Section 7

**NOTE:** Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.



LA / LH 2P and 3P  
6 in. (152 mm)  
Mounting Height

**Table 3.21: L-Frame—400 A, Thermal-Magnetic, I-Line® Construction, High Magnetic Withstand Circuit Breakers For Mission Critical Loads**

Ampere Rating	AC Magnetic Level Factory Set▲	Standard Interrupting		High Interrupting		Terminal Wire Range
		Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>LA/LH MC Circuit Breaker, 3P, 480 Vac</b>						
200 A	4000 A	LA34200MC	5571.00	LH34200MC	8771.00	AL250LA (1) 4 AWG–350 kcmil Al
225 A	4500 A	LA34225MC	5571.00	LH34225MC	8771.00	
250 A	5000 A	LA34250MC	5681.00	LH34250MC	8882.00	
400 A	8000 A	LA34400MC	7241.00	LH34400MC	10142.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al

▲ Factory set AC magnetic setting tolerances are +0–25% from max. value shown.

**Table 3.22: L-Frame—600 A, Thermal-Magnetic I-Line® Construction Circuit Breakers, 600 Vac**

Ampere Rating	Adjustable AC Magnetic Trip■		Standard Interrupting		High Interrupting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2P, 600 Vac, 250 Vdc▲</b>							
125 A	625 A	1250 A	LA26125()	4053.00	LH26125()	6762.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
150 A	750 A	1500 A	LA26150()	4053.00	LH26150()	6762.00	
175 A	875 A	1750 A	LA26175()	4053.00	LH26175()	6762.00	
200 A	1000 A	2000 A	LA26200()	4053.00	LH26200()	6762.00	
225 A	1125 A	2250 A	LA26225()	4053.00	LH26225()	6762.00	
250 A	1250 A	2500 A	LA26250()	4053.00	LH26250()	6762.00	
300 A	1500 A	3000 A	LA26300()	4053.00	LH26300()	6762.00	
350 A	1750 A	3500 A	LA26350()	4053.00	LH26350()	6762.00	
400 A	2000 A	4000 A	LA26400()	4053.00	LH26400()	6762.00	
<b>3P, 600 Vac, 250 Vdc</b>							
125 A	625 A	1250 A	LA36125	4944.00	LH36125	8145.00	AL400LA (1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al
150 A	750 A	1500 A	LA36150	4944.00	LH36150	8145.00	
175 A	875 A	1750 A	LA36175	4944.00	LH36175	8145.00	
200 A	1000 A	2000 A	LA36200	4944.00	LH36200	8145.00	
225 A	1125 A	2250 A	LA36225	4944.00	LH26225	8145.00	
250 A	1250 A	2500 A	LA36250	4944.00	LH36250	8145.00	
300 A	1500 A	3000 A	LA36300	4944.00	LH36300	8145.00	
350 A	1750 A	3500 A	LA36350	4944.00	LH36350	8145.00	
400 A	2000 A	4000 A	LA36400	4944.00	LH36400	8145.00	



LI 2P and 3P  
7.5 in. (190 mm)  
Mounting Height

**Table 3.23: L-Frame—600 A, Current-Limiting, I-Line® Construction, Circuit Breakers, 600 Vac**

Ampere Rating	Adjustable AC Magnetic Trip■		Extra-High Interrupting		Current Limiting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2P, 600 Vac▲</b>							
300 A	1500 A	3200 A	LC26300()	8312.00	LI26300()	9563.00	AL600LI5 (2) 4/0 AWG–500 kcmil Al
350 A	1750 A	3200 A	LC26350()	8312.00	LI26350()	9563.00	
400 A	2000 A	3200 A	LC26400()	8312.00	LI26400()	9563.00	
450 A	2250 A	4200 A	LC26450()	8691.00	LI26450()	13949.00	
500 A	2500 A	4200 A	LC26500()	8691.00	LI26500()	13949.00	
600 A	3000 A	4200 A	LC26600()	8691.00	LI26600()	13949.00	
<b>3P, 600 Vac</b>							
300 A	1500 A	3200 A	LC36300	9234.00	LI36300	10673.00	AL600LI5 (2) 4/0 AWG–500 kcmil Al
350 A	1750 A	3200 A	LC36350	9234.00	LI36350	10673.00	
400 A	2000 A	3200 A	LC36400	9234.00	LI36400	10673.00	
450 A	2250 A	4200 A	LC36450	9657.00	LI36450	15498.00	
500 A	2500 A	4200 A	LC36500	9657.00	LI36500	15498.00	
600 A	3000 A	4200 A	LC36600	9657.00	LI36600	15498.00	

▲ 2P and 3P circuit breaker catalog numbers are completed by adding the required phase connection letters as a suffix. See Phase Option Table.

■ UL magnetic trip setting tolerances are ±25% for low and ±20% for high from nominal value.

**Table 3.24: Interrupting Ratings**

Voltage	LA	LH	LC	LI
240 Vac	42 kA	65 kA	100 kA	200 kA
480 Vac	30 kA	35 kA	65 kA	200 kA
600 Vac	22 kA	25 kA	35 kA	100 kA

**Table 3.25: Phase Options**

Phase Option Letter	2P	3P
AB	LA26400AB	
AC	LA26400AC	
BC	LA26400BC	
ABC		LA36400
CBA		LA36400CBA

Accessories ..... Page 3-26–3-28  
Optional Lugs ..... Page 3-29–3-30  
Dimensions ..... Page 3-35  
Enclosures: see Digest Section 7



LC 2P and 3P  
7.5 in. (190 mm)  
Mounting Height

**Standard-Function Features:**

- 80% rated
- True RMS sensing
- Interchangeable rating plugs
- LSI, LS(I)G, trip configurations
- Short-time delay = I<sup>2</sup>t IN and ground-fault delay = I<sup>2</sup>t OUT
- Integral ground-fault testing
- LED long-time pickup indication
- Thermal & magnetic backup protection
- Long-time & ground-fault memory
- Optional local trip indicators—overload, short circuit, ground-fault
- Optional local ammeter/trip indicator
- Universal test set available
- Optional I-Line® mounting (LX, LXI)
- Optional neutral current transformer for 4-wire systems

**Full-Function Features:**

- 100% rated (600 sensor LE/LEL circuit breakers are 80% rated)
- True RMS sensing
- Interchangeable rating plugs
- PowerLogic® compatible
- LI, LIG, LS(I), LS(I)G (instantaneous OFF) configurations
- Short-time delay = I<sup>2</sup>t IN & I<sup>2</sup>t OUT and ground-fault delay = I<sup>2</sup>t IN & I<sup>2</sup>t OUT
- Short-time withstand rating
- Integral ground-fault testing
- Optional ground-fault alarm (no trip) (Requires CIM3F with PowerLogic, see Bulletin 0502DB0001.)
- LED long-time pickup indication
- Zone-selective interlocking (short-time & ground-fault)
- Long-time & ground-fault memory
- Local Trip Indicators—overload, short circuit, ground-fault
- Local ammeter/trip indicator
- Universal test set available
- Optional I-Line® mounting (LE)
- Optional neutral current transformer for 4-wire systems

**Table 3.26: L-Frame—600 A, Micrologic Series B Trip System, Individually-Mounted, 3P, 600 Vac**

Sensor Size	Ampere Rating	Trip Function	Standard Function		Standard Function Current Limiting		100% Rated Full Function■		Installed Rating Plug	Terminal Wire Range
			Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price		
250	100	LI	—	—	—	—	LEL36100LI	7692.00	ARP040	AL600LI35 (2) 1 AWG—350 kcmil Al/Cu
		LSI	LXL36100	5616.00	LXIL36100	11262.00	LXL36100LS	13035.00		
		LIG	—	—	—	—	LXL36100LIG	9768.00		
		LSIG	LXL36100G	7692.00	LXIL36100G	13338.00	LXL36100LSG	15111.00		
	125	LI	—	—	—	—	LXL36125LI	7692.00	ARP050	
		LSI	LXL36125	5616.00	LXIL36125	11262.00	LXL36125LS	13035.00		
		LIG	—	—	—	—	LXL36125LIG	9768.00		
150	LI	—	—	—	—	LXL36125LSG	15111.00	ARP060		
	LSI	LXL36150	5616.00	LXIL36150	11262.00	LXL36150LI	7692.00			
	LIG	—	—	—	—	LXL36150LS	13035.00			
400	175	LIG	—	—	—	—	LXL36150LIG	9768.00	ARP070	
		LSIG	LXL36150G	7692.00	LXIL36150G	13338.00	LXL36150LSG	15111.00		
		LI	—	—	—	—	LXL36175LI	7692.00		
	200	LSI	LXL36175	5616.00	LXIL36175	11262.00	LXL36175LS	13035.00	ARP080	
		LIG	—	—	—	—	LXL36175LIG	9768.00		
		LSIG	LXL36175G	7692.00	LXIL36175G	13338.00	LXL36175LSG	15111.00		
	225	LI	—	—	—	—	LXL36200LI	7692.00	ARP090	
LSI		LXL36200	5616.00	LXIL36200	11262.00	LXL36200LS	13035.00			
LIG		—	—	—	—	LXL36200LIG	9768.00			
LSIG		LXL36200G	7692.00	LXIL36200G	13338.00	LXL36200LSG	15111.00			
250	LI	—	—	—	—	LXL36200LSG	15111.00	ARP100		
	LSI	LXL36225	5616.00	LXIL36225	11262.00	LXL36225LI	7692.00			
	LIG	—	—	—	—	LXL36225LS	13035.00			
	LSIG	LXL36225G	7692.00	LXIL36225G	13338.00	LXL36225LIG	9768.00			
600 ▲	300	LIG	—	—	—	—	LXL36225LSG	15111.00	ARP100	
		LSI	LXL36250	5616.00	LXIL36250	11262.00	LXL36250LI	7692.00		
		LIG	—	—	—	—	LXL36250LS	13035.00		
	350	LIG	—	—	—	—	LXL36250LIG	9768.00	ARP075	
		LSIG	LXL36250G	7692.00	LXIL36250G	13338.00	LXL36250LSG	15111.00		
		LI	—	—	—	—	LXL36300LI	10691.00		
		LSI	LXL36300	8618.00	LXIL36300	16400.00	LXL36300LS	16034.00		
400	LIG	—	—	—	—	LXL36300LIG	12767.00	ARP088		
	LSIG	LXL36300G	10694.00	LXIL36300G	18476.00	LXL36300LSG	18110.00			
	LI	—	—	—	—	LXL36350LI	10691.00			
450	LSI	LXL36350	8618.00	LXIL36350	16400.00	LXL36350LS	16034.00	ARP100		
	LIG	—	—	—	—	LXL36350LIG	12767.00			
	LSIG	LXL36350G	10694.00	LXIL36350G	18476.00	LXL36350LSG	18110.00			
	LI	—	—	—	—	LXL36400LI	10691.00			
600 ▲	500	LSI	LXL36400	8618.00	LXIL36400	16400.00	LXL36400LS	16034.00	ARP075	
		LIG	—	—	—	—	LXL36400LIG	12767.00		
		LSIG	LXL36400G	10694.00	LXIL36400G	18476.00	LXL36400LSG	18110.00		
	600	LI	—	—	—	—	LXL36450LI	14688.00	ARP083	
		LSI	LXL36450	12611.00	LXIL36450	23250.00	LXL36450LS	20031.00		
		LIG	—	—	—	—	LXL36450LIG	16764.00		
		LSIG	LXL36450G	14687.00	LXIL36450G	25326.00	LXL36450LSG	22107.00		
600	LI	—	—	—	—	LXL36500LI	14688.00	ARP083		
	LSI	LXL36500	12611.00	LXIL36500	23250.00	LXL36500LS	20031.00			
	LIG	—	—	—	—	LXL36500LIG	16764.00			
600	LSIG	LXL36500G	14687.00	LXIL36500G	25326.00	LXL36500LSG	22107.00	ARP100		
	LI	—	—	—	—	LXL36600LI	14688.00			
	LSI	LXL36600	12611.00	LXIL36600	23250.00	LXL36600LS	20031.00			
600	LIG	—	—	—	—	LXL36600LIG	16764.00	ARP100		
	LSIG	LXL36600G	14687.00	LXIL36600G	25326.00	LXL36600LSG	22107.00			

▲ 600 A sensor is 80% rated  
■ Substitute (A) in place of (G) for ground-fault alarm (pickup indication only). Requires CIM3F and PowerLogic, or see Data Bulletin 0502DB0001. No instantaneous OFF position for LI or LIG trip function type circuit breakers.

**NOTE:** Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.

Accessories ..... Page 3-26—3-28  
Optional Lugs ..... Page 3-29—3-30  
Dimensions ..... Page 3-35

**Table 3.27: Interrupting Ratings**

Voltage	LXL	LEL	LXIL
240 V	100 kA	100 kA	200 kA
480 V	65 kA	65 kA	200 kA
600 V	35 kA	35 kA	100 kA

3 MOLDED CASE CIRCUIT BREAKERS



Micrologic Standard-Function Trip Systems (LXL, LXIL)



Micrologic Full-Function Trip Systems (LEL)

**NOTE:** Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.

**Table 3.28: L-Frame—600 A, Micrologic Series B Trip System, I-Line® Construction, 3P, 600 Vac**

Sensor Size	Ampere Rating	Trip Function	Standard Function		100% Rated Full Function■		Installed Rating Plug	Terminal Wire Range
			Cat. No.	\$ Price	Cat. No.	\$ Price		
250	100	LI	—	—	LE36100LI	8078.00	ARP040	AL600LI35 (2) 1 AWG–350 kcmil Al/Cu
		LSI	LX36100	5898.00	LE36100LS	13421.00		
		LIG	—	—	LE36100LIG	10154.00		
		LSIG	LX36100G	7974.00	LE36100LSG	15497.00		
	125	LI	—	—	LE36125LI	8078.00	ARP050	
		LSI	LX36125	5898.00	LE36125LS	13421.00		
		LIG	—	—	LE36125LIG	10154.00		
		LSIG	LX36125G	7974.00	LE36125LSG	15497.00		
	150	LI	—	—	LE36150LI	8078.00	ARP060	
		LSI	LX36150	5898.00	LE36150LS	13421.00		
		LIG	—	—	LE36150LIG	10154.00		
		LSIG	LX36150G	7974.00	LE36150LSG	15497.00		
175	LI	—	—	LE36175LI	8078.00	ARP070		
	LSI	LX36175	5898.00	LE36175LS	13421.00			
	LIG	—	—	LE36175LIG	10154.00			
	LSIG	LXL36175G	7974.00	LE36175LSG	15497.00			
200	LI	—	—	LE36200LI	8078.00	ARP080		
	LSI	LX36200	5898.00	LE36200LS	13421.00			
	LIG	—	—	LE36200LIG	10154.00			
	LSIG	LX36200G	7974.00	LE36200LSG	15497.00			
225	LI	—	—	LE36225LI	8078.00	ARP090		
	LSI	LX36225	5898.00	LE36225LS	13421.00			
	LIG	—	—	LE36225LIG	10154.00			
	LSIG	LX36225G	7974.00	LE36225LSG	15497.00			
250	LI	—	—	LE36250LI	8078.00	ARP100		
	LSI	LX36250	5898.00	LE36250LS	13421.00			
	LIG	—	—	LE36250LIG	10154.00			
	LSIG	LX36250G	7974.00	LE36250LSG	15497.00			
400	300	LI	—	—	LE36300LI	11223.00	ARP075	AL600LI5 (2) 4/0 AWG–500 kcmil Al/Cu
		LSI	LX36300	9047.00	LE36300LS	16566.00		
		LIG	—	—	LE36300LIG	13299.00		
		LSIG	LX36300G	11123.00	LE36300LSG	18642.00		
	350	LI	—	—	LE36350LI	11223.00	ARP088	
		LSI	LX36350	9047.00	LE36350LS	16566.00		
400	LI	—	—	LE36400LI	11223.00	ARP100		
	LSI	LX36400	9047.00	LE36400LS	16566.00			
	LIG	—	—	LE36400LIG	13299.00			
	LSIG	LX36400G	11123.00	LE36400LSG	18642.00			
600 ▲	450	LI	—	—	LE36450LI	15422.00	ARP075	
		LSI	LX36450	13241.00	LE36450LS	20765.00		
		LIG	—	—	LE36450LIG	17498.00		
		LSIG	LX36450G	15317.00	LE36450LSG	22841.00		
	500	LI	—	—	LE36500LI	15422.00	ARP083	
		LSI	LX36500	13241.00	LE36500LS	20765.00		
		LIG	—	—	LE36500LIG	17498.00		
		LSIG	LX36500G	15317.00	LE36500LSG	22841.00		
600	LI	—	—	LE36600LI	15422.00	ARP100		
	LSI	LX36600	13241.00	LE36600LS	20765.00			
	LIG	—	—	LE36600LIG	17498.00			
	LSIG	LX36600G	15317.00	LE36600LSG	22841.00			

- ▲ 600 A sensor is 80% rated
- Substitute (A) in place of (G) for ground-fault alarm (pickup indication only). Requires CIM3F and Powerlogic, or see Data Bulletin 0502DB0001. No instantaneous OFF position for LI or LIG trip function type circuit breakers.

**Table 3.29: Interrupting Ratings**

Voltage	LX	LE	LXI
240 Vac	100 kA	100 kA	200 kA
480 Vac	65 kA	65 kA	200 kA
600 Vac	35 kA	35 kA	100 kA

Accessories ..... Page 3-26—3-28  
 Optional Lugs ..... Page 3-29—3-30  
 Dimensions ..... Page 3-35  
 Enclosures: see Digest Section 7

**3 MOLDED CASE CIRCUIT BREAKERS**



MAL/MHL 2P and 3P  
300–1000 A

**Table 3.30: M-Frame—Thermal-Magnetic, Individually-Mounted Circuit Breakers, 600 Vac**

Ampere Rating	AC Magnetic Trip Settings▲		Standard Interrupting		High Interrupting		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2P, 600 Vac, 250 Vdc</b>							
300 A	1500 A	3000 A	MAL26300	5960.00	MHL26300	7829.00	AL900MA (3) 3/0 AWG–500 kcmil
350 A	1750 A	3500 A	MAL26350	5960.00	MHL26350	7829.00	
400 A	2000 A	4000 A	MAL26400	5960.00	MHL26400	7829.00	
450 A	2250 A	4500 A	MAL26450	5960.00	MHL26450	7829.00	
500 A	2500 A	5000 A	MAL26500	5960.00	MHL26500	7829.00	
600 A	3000 A	6000 A	MAL26600	5960.00	MHL26600	7829.00	
700 A	3500 A	7000 A	MAL26700	7719.00	MHL26700	9657.00	
800 A	4000 A	8000 A	MAL26800	7719.00	MHL26800	9657.00	
900 A	4500 A	9000 A	MAL26900	11012.00	MHL26900	12212.00	
1000 A	5000 A	10000 A	MAL261000	11012.00	MHL261000	12212.00	
1200 A	5000 A	10000 A	MAL261200	12948.00	MHL261200	15252.00	
<b>3P, 600 Vac, 250 Vdc</b>							
300 A	1500 A	3000 A	MAL36300	7560.00	MHL36300	9456.00	AL900MA (3) 3/0 AWG–500 kcmil
350 A	1750 A	3500 A	MAL36350	7560.00	MHL36350	9456.00	
400 A	2000 A	4000 A	MAL36400	7560.00	MHL36400	9456.00	
450 A	2250 A	4500 A	MAL36450	7560.00	MHL36450	9456.00	
500 A	2500 A	5000 A	MAL36500	7560.00	MHL36500	9456.00	
600 A	3000 A	6000 A	MAL36600	9927.00	MHL36600	9456.00	
700 A	3500 A	7000 A	MAL36700	9927.00	MHL36700	11882.00	
800 A	4000 A	8000 A	MAL36800	12705.00	MHL36800	11882.00	
900 A	4500 A	9000 A	MAL36900	12705.00	MHL36900	14078.00	
1000 A	5000 A	10000 A	MAL361000	12705.00	MHL361000	14078.00	
1200 A	5000 A	10000 A	MAL361200	15107.00	MHL361200	17612.00	

- ▲ UL magnetic trip setting tolerances are ±25% for low and ±20% for high from nominal values shown.
- The AL100MA lug is the only lug available for the 1200 A MA and MH circuit breakers.

**Table 3.31: M-Frame—Thermal-Magnetic, I-Line® Construction Circuit Breakers, 600 Vac**

Ampere Rating	AC Magnetic Trip Settings♦		Standard Interrupting		High Interrupting		Terminal Wire Range	
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price		
<b>2P, 600 Vac, 250 Vdc*</b>								
300 A	1500 A	3000 A	MA26300()	6633.00	MH26300()	8253.00	AL900MA (3) 3/0 AWG–500 kcmil	
350 A	1750 A	3500 A	MA26350()	6633.00	MH26350()	8253.00		
400 A	2000 A	4000 A	MA26400()	6633.00	MH26400()	8253.00		
450 A	2250 A	4500 A	MA26450()	6633.00	MH26450()	8253.00		
500 A	2500 A	5000 A	MA26500()	6633.00	MH26500()	8253.00		
600 A	3000 A	6000 A	MA26600()	6633.00	MH26600()	8253.00		
700 A	3500 A	7000 A	MA26700()	8370.00	MH26700()	10104.00		
800 A	4000 A	8000 A	MA26800()	8370.00	MH26800()	10104.00		
<b>3P, 600 Vac, 250 Vdc</b>								
300 A	1500 A	3000 A	MA36300	8168.00	MH36300	9929.00		AL900MA (3) 3/0 AWG–500 kcmil
350 A	1750 A	3500 A	MA36350	8168.00	MH36350	9929.00		
400 A	2000 A	4000 A	MA36400	8168.00	MH36400	9929.00		
450 A	2250 A	4500 A	MA36450	8168.00	MH36450	9929.00		
500 A	2500 A	5000 A	MA36500	8168.00	MH36500	9929.00		
600 A	3000 A	6000 A	MA36600	8168.00	MH36600	9929.00		
700 A	3500 A	7000 A	MA36700	10608.00	MH36700	12630.00		
800 A	4000 A	8000 A	MA36800	10608.00	MH36800	12630.00		

- ♦ UL magnetic trip setting tolerances are ±25% for low and ±20% for high from nominal values shown.
- \* 2P circuit breaker catalog numbers are completed by adding required phase connection letters as suffix to catalog numbers. See Phase Options table.

**Table 3.32: Interrupting Ratings**

Voltage	MA/MAL	MH/MHL
240 Vac	42 kA	65 kA
480 Vac	30 kA	65 kA
600 Vac	22 kA	25 kA

**Table 3.33: Phase Options**

Phase Option Letter	2P	3P
AB	MA26800AB	
AC	MA26800AC	
BC	MA26800BC	
ABC		MA36800
CBA		MA36800CBA

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NAL/NCL  
2P and 3P  
600–1200 A

**Table 3.36: N-Frame, Thermal-Magnetic Circuit Breakers, 600 Vac**

Continuous Current Rating @ 40°C	AC Magnetic Trip Settings▲		Individually-Mounted Circuit Breakers				I-Line® Circuit Breakers				Terminal Wire Range
			Standard Interrupting		Extra High Interrupting		Standard Interrupting		Extra High Interrupting		
			Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2P, 600 Vac■</b>											
600 A	4000 A	8000 A	NAL26600	17363.00	NCL26600	19994.00	NA26600( )	18321.00	NC26600( )	20948.00	AL1200NE6 (4) 3/0 AWG– 600 kcmil
700 A	4000 A	8000 A	NAL26700	17363.00	NCL26700	19994.00	NA26700( )	18321.00	NC26700( )	20948.00	
800 A	4000 A	8000 A	NAL26800	17363.00	NCL26800	19994.00	NA26800( )	18321.00	NC26800( )	20948.00	
900 A	5000 A	10000 A	NAL26900	17363.00	NCL26900	19994.00	NA26900( )	18321.00	NC26900( )	20948.00	
1000 A	5000 A	10000 A	NAL261000	17363.00	NCL261000	19994.00	NA261000( )	18321.00	NC261000( )	20948.00	
1200 A	5000 A	10000 A	NAL261200	17363.00	NCL261200	19994.00	NA261200( )	18321.00	NC261200( )	20948.00	
<b>3P, 600 Vac</b>											
600 A	4000 A	8000 A	NAL36600	19049.00	NCL36600	21452.00	NA36600	20003.00	NC36600	22410.00	AL1200NE6 (4) 3/0 AWG– 600 kcmil
700 A	4000 A	8000 A	NAL36700	19049.00	NCL36700	21452.00	NA36700	20003.00	NC36700	22410.00	
800 A	4000 A	8000 A	NAL36800	19049.00	NCL36800	21452.00	NA36800	20003.00	NC36800	22410.00	
900 A	5000 A	10000 A	NAL36900	19049.00	NCL36900	21452.00	NA36900	20003.00	NC36900	22410.00	
1000 A	5000 A	10000 A	NAL361000	19049.00	NCL361000	21452.00	NA361000	20003.00	NC361000	22410.00	
1200 A	5000 A	10000 A	NAL361200	19049.00	NCL361200	21452.00	NA361200	20003.00	NC361200	22410.00	

▲ UL magnetic trip setting tolerances are ±25% (for low) and ±20% (for high) from nominal values shown.  
■ 2P I-Line circuit breaker catalog numbers are completed by adding required phase connection letters as suffix to catalog number.

**Table 3.37: N-Frame—Micrologic® Electronic Trip System, 3P Circuit Breakers, 600Vac**

Sensor Size	Ampere Rating	Trip Function	Individually-Mounted Circuit Breakers				I-Line® Circuit Breakers				Installed Rating Plug	Terminal Wire Range
			Standard Function		100% Rated, Full Function♦		Standard Function		100% Rated, Full Function♦			
			Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price		
1200 A	600 A	LI	—	—	NEL36600LI	32372.00	—	—	NE36600LI	33990.00	ARP050	AL1200NE6 (4) 3/0 AWG–600 kcmil
		LSI	NXL36600	20873.00	NEL36600LS	37715.00	NX36600	21917.00	NE36600LS	39333.00		
		LIG	—	—	NEL36600LIG	37715.00	—	—	NE36600LIG	39333.00		
		LSIG	NXL36600G	22949.00	NEL36600LSG	43058.00	NX36600G	23993.00	NE36600LSG	44676.00		
	700 A	LI	—	—	NEL36700LI	32372.00	—	—	NE36700LI	33990.00	ARP058	
		LSI	NXL36700	20873.00	NEL36700LS	37715.00	NX36700	21917.00	NE36700LS	39333.00		
		LIG	—	—	NEL36700LIG	37715.00	—	—	NE36700LIG	39333.00		
		LSIG	NXL36700G	22949.00	NEL36700LSG	43058.00	NX36700G	23993.00	NE36700LSG	44676.00		
	800 A	LI	—	—	NEL36800LI	32372.00	—	—	NE36800LI	33990.00	ARP067	
		LSI	NXL36800	20873.00	NEL36800LS	37715.00	NX36800	21917.00	NE36800LS	39333.00		
		LIG	—	—	NEL36800LIG	37715.00	—	—	NE36800LIG	39333.00		
		LSIG	NXL36800G	22949.00	NEL36800LSG	43058.00	NX36800G	23993.00	NE36800LSG	44676.00		
	900 A	LI	—	—	NEL36900LI	32372.00	—	—	NE36900LI	33990.00	ARP075	
		LSI	NXL36900	20873.00	NEL36900LS	37715.00	NX36900	21917.00	NE36900LS	39333.00		
		LIG	—	—	NEL36900LIG	37715.00	—	—	NE36900LIG	39333.00		
		LSIG	NXL36900G	22949.00	NEL36900LSG	43058.00	NX36900G	23993.00	NE36900LSG	44676.00		
	1000 A	LI	—	—	NEL361000LI	32372.00	—	—	NE361000LI	33990.00	ARP083	
		LSI	NXL361000	21917.00	NEL361000LS	37715.00	NX361000	23013.00	NE361000LS	39333.00		
		LIG	—	—	NEL361000LIG	37715.00	—	—	NE361000LIG	39333.00		
		LSIG	NXL361000G	23993.00	NEL361000LSG	43058.00	NX361000G	25193.00	NE361000LSG	44676.00		
	1200 A	LI	—	—	NEL361200LI	32372.00	—	—	NE361200LI	33990.00	ARP100	
		LSI	NXL361200	21917.00	NEL361200LS	37715.00	NX361200	23013.00	NE361200LS	39333.00		
		LIG	—	—	NEL361200LIG	37715.00	—	—	NE361200LIG	39333.00		
		LSIG	NXL361200G	23993.00	NEL361200LSG	43058.00	NX361200G	25193.00	NE361200LSG	44676.00		

♦ Substitute (A) in place of (G) for ground-fault alarm (pick up indication only). No instantaneous OFF position for LI or LIG circuit breakers.

**Table 3.38: Interrupting Ratings**

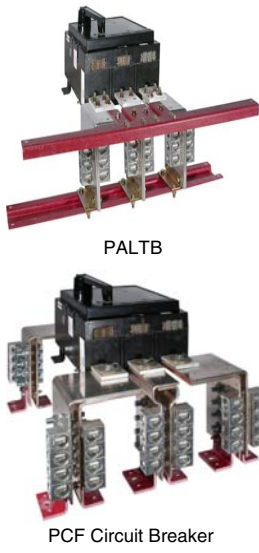
Voltage	NA, NAL,	NC, NCL	NX, NXL	NE, NEL
240 V	100kA	125 kA	125 kA	125 kA
480 V	50 kA	100 kA	100 kA	100 kA
600 V	25 kA	65 kA	65 kA	65 kA

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3 MOLDED CASE CIRCUIT BREAKERS

PAF, PHF, PXF-12, PEF-12, PXF-16, PEF-16, and PXF-20 circuit breakers can be bus- or cable-connected. For cable connections, optional terminal pad kit PALTB or equivalent bus structure is required. Each PALTB kit contains terminal pads for one end of the circuit breaker only and has provisions for mounting a maximum of six lugs per phase. Order lugs separately. See page 3-29 and 3-30.

PCF, PEF-20, PXF-25 or PEF-25 circuit breakers are supplied with terminal pads for both ends of the circuit breaker. The supplied terminal pads or equivalent bus structure must be used for bus- or cable-connections. Terminal pads have provisions for mounting a maximum of eight lugs per phase. Order lugs separately. See page 3-29 and 3-30.



**Table 3.39: P-Frame Thermal-Magnetic Circuit Breakers**

Ampere Rating	AC Magnetic Trip Settings		2P—600 Vac				3P—600 Vac					
	Low	High	Frame Only		Rating Columns Two Per Kit		Total \$ Price ▲	Frame Only		Rating Columns Three Per Kit		Total \$ Price ▲
			Cat. No.	\$ Price	Kit Cat. No.	Kit \$ Price		Cat. No.	\$ Price	Kit Cat. No.	Kit \$ Price	
<b>2000 A Frame PAF Standard Interrupting—Complete Circuit Breaker Requires Frame and Rating Columns</b>												
600 A	3200 A	9000 A	PAF2026	17024.00	PA2600RC	366.00	17390.00	PAF2036	21822.00	PA3600RC	552.00	22374.00
700 A	3200 A	9000 A			PA2700RC					PA3700RC		
800 A	3200 A	9000 A			PA2800RC					PA3800RC		
1000 A	3500 A	9000 A			PA21000RC					PA31000RC		
1200 A	3500 A	9000 A			PA21200RC					PA31200RC		
1400 A	4500 A	9000 A			PA21400RC					PA31400RC		
1600 A	5000 A	10000 A			PA21600RC					PA31600RC		
1800 A	6500 A	11000 A			PA21800RC					PA31800RC		
2000 A	8000 A	12000 A	PA22000RC	PA32000RC								
<b>2000 A Frame PHF High Interrupting—Complete Circuit Breaker Requires Frame and Rating Columns</b>												
600 A	3200 A	9000 A	PHF2026	19526.00	PA2600RC	366.00	19892.00	PHF2036	24171.00	PA3600RC	552.00	24723.00
700 A	3200 A	9000 A			PA2700RC					PA3700RC		
800 A	3200 A	9000 A			PA2800RC					PA3800RC		
1000 A	3500 A	9000 A			PA21000RC					PA31000RC		
1200 A	3500 A	9000 A			PA21200RC					PA31200RC		
1400 A	4500 A	9000 A			PA21400RC					PA31400RC		
1600 A	5000 A	10000 A			PA21600RC					PA31600RC		
1800 A	6500 A	11000 A			PA21800RC					PA31800RC		
2000 A	8000 A	12000 A	PA22000RC	PA32000RC								
<b>2500 A Frame PCF High Interrupting—Complete Circuit Breaker Requires Frame and Rating Columns</b>												
1600 A	6000 A	12000 A	PCF2526	31413.00	PC21600RC	366.00	31779.00	PCF2536	38832.00	PC31600RC	552.00	39384.00
1800 A	6000 A	12000 A			PC21800RC					PC31800RC		
2000 A	6000 A	12000 A			PC22000RC					PC32000RC		
2000 A	8000 A	14000 A			PC22500RC					PC32500RC		

▲ Price does not include lugs. See page 3-29 for catalog numbers and prices.  
■ UL magnetic trip setting tolerances are ±25% for low and ±20% for high from nominal values shown.

**Table 3.40: Interrupting Ratings**

Voltage	PAF
240 Vac	65 kA
480 Vac	50 kA
600 Vac	42 kA

PCF/PHF	PXF/PEF
125 kA	125 kA
100 kA	100 kA
65 kA	65 kA

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**Table 3.41: P-Frame Micrologic Series B Electronic Trip Unit Circuit Breakers**

Sensor Size	Ampere Rating	Trip Function	Standard Function		100% Rated ♦, Full Function★		Installed Rating Plug
			Cat. No.	\$ Price	Cat. No.	\$ Price	
1200 A	600 A	LI	—	—	PEF36600LI	29163.00	ARP050
		LSI	PXF36600	18872.00	PEF36600LS	34506.00	
		LIG	—	—	PEF36600LIG	34506.00	
		LSIG	PXF36600G	20948.00	PEF36600LSG	39849.00	
	700 A	LI	—	—	PEF36700LI	29163.00	ARP058
		LSI	PXF36700	18872.00	PEF36700LS	34506.00	
		LIG	—	—	PEF36700LIG	34506.00	
		LSIG	PXF36700G	20948.00	PEF36700LSG	39849.00	
	800 A	LI	—	—	PEF36800LI	29163.00	ARP067
		LSI	PXF36800	18872.00	PEF36800LS	34506.00	
		LIG	—	—	PEF36800LIG	34506.00	
		LSIG	PXF36800G	20948.00	PEF36800LSG	39849.00	
	900 A	LI	—	—	PEF36900LI	29163.00	ARP075
		LSI	PXF36900	18872.00	PEF36900LS	34506.00	
		LIG	—	—	PEF36900LIG	34506.00	
		LSIG	PXF36900G	20948.00	PEF36900LSG	39849.00	
	1000 A	LI	—	—	PEF361000LI	29163.00	ARP083
		LSI	PXF361000	18872.00	PEF361000LS	34506.00	
		LIG	—	—	PEF361000LIG	34506.00	
		LSIG	PXF361000G	20948.00	PEF361000LSG	39849.00	
	1200 A	LI	—	—	PEF361200LI	29163.00	ARP100
		LSI	PXF361200	18872.00	PEF361200LS	34506.00	
		LIG	—	—	PEF361200LIG	34506.00	
		LSIG	PXF361200G	20948.00	PEF361200LSG	39849.00	
1600 A	1400 A	LI	—	—	PEF361400LI	31403.00	ARP088
		LSI	PXF361400	20610.00	PEF361400LS	36746.00	
		LIG	—	—	PEF361400LIG	36746.00	
		LSIG	PXF361400G	22686.00	PEF361400LSG	42089.00	
1600 A	1600 A	LI	—	—	PEF361600LI	31403.00	ARP100
		LSI	PXF361600	20610.00	PEF361600LS	36746.00	
		LIG	—	—	PEF361600LIG	36746.00	
		LSIG	PXF361600G	22686.00	PEF361600LSG	42089.00	
2000 A	1800 A	LI	—	—	PEF361800LI	37256.00	ARP090
		LSI	PXF361800	23234.00	PEF361800LS	42599.00	
		LIG	—	—	PEF361800LIG	42599.00	
		LSIG	PXF361800G	25310.00	PEF361800LSG	47942.00	
2000 A	2000 A	LI	—	—	PEF362000LI	37256.00	ARP0100
		LSI	PXF362000	23234.00	PEF362000LS	42599.00	
		LIG	—	—	PEF362000LIG	42599.00	
		LSIG	PXF362000G	25310.00	PEF362000LSG	47942.00	
2500 A ♦	2500 A	LI	—	—	PEF362500LI	56922.00	ARP100
		LSI	PXF362500	39261.00	PEF362500LS	62265.00	
		LIG	—	—	PEF362500LIG	62265.00	
		LSIG	PXF362500G	41337.00	PEF362500LSG	67608.00	

♦ 2500 A sensor is 80% rated.  
★ Substitute (A) in place of (G) for ground-fault alarm (pick up indication only.) Requires CIM3F with PowerLogic® or see Data Bulletin 0502DB0001. No instantaneous OFF position for LI or LIG circuit breakers.

3 MOLDED CASE CIRCUIT BREAKERS

**Automatic Molded Case Switches**

Automatic molded case switches open instantaneously at a factory preset magnetic trip point, calibrated to protect only the molded case switch itself, when it is subjected to high fault currents. The trip point is nonadjustable and provides no overload or low level fault protection.

Molded case switches open when the handle is switched to the OFF position or in response to an auxiliary tripping device such as a shunt trip.

Automatic switches will accept the same lugs and accessories as equivalent thermal-magnetic circuit breakers.

Automatic molded case switches are UL Listed per UL 489 and are CSA® Certified.

**Table 3.42: Automatic Molded Case Switches 600 Vac**

Ampere Rating	Poles	3P		Short Circuit Current Rating▲			Trip Point (Automatic Switch)■		Lug Kit Installed
		Cat. No.	\$ Price	240 Vac	480 Vac	600 Vac	AC	DC	
1200 A	2	NCL2600012M	10887.00	125k	100 kA	65 kA	16000 A	N/A	AL1200NE6
1200 A	3	NCL3600012M	12570.00	125k	100 kA	65 kA	16000 A	N/A	AL1200NE6

- ▲ The short circuit current rating is the fault current, at rated voltage, that the molded case switch will withstand without damage when protected by a circuit breaker with an equal continuous current rating.
- UL magnetic trip setting tolerances are -20% and +30% from the nominal values shown.

**Table 3.43: Automatic Molded Case Switches, 600 Vac**

Ampere Rating	2P		3P		Withstand Rating▼				Trip Point (A)		Lug Kit Installed
	Cat. No.	\$ Price	Cat. No.	\$ Price	240 Vac	480 Vac	600 Vac	250 Vdc	AC♦	DC♦	
100	FHL26000M★	779.00	FHL36000M★	1001.00	65k	25k	18k	10k	1500	1725	AL100FA
150	—	—	FHL3600015M★	1500.00	65k	25k	18k	—	2500	—	AL150FA
400	LHL26000M	3596.00	LHL36000M	4329.00	65k	35k	25k	10k	8000	9600	AL400LA

- ♦ UL magnetic trip tolerances are -20% / +30% from the nominal values shown.
- ★ FHL and KHL automatic switches will not accept cylinder lock attachments.
- ▼ The withstand rating is the fault current at rated voltage that the molded case switch will withstand without damage when protected by a circuit breaker with an equal continuous current rating.

**Table 3.44: Automatic Molded Case Switches, 600 Vac**

Ampere Rating	2P		3P		Withstand Rating□				Trip Point (A)		Lug Kit Installed
	Cat. No.	\$ Price	Cat. No.	\$ Price	240 Vac	480 Vac	600 Vac	250 Vdc	AC△	DC△	
600	MHL260006M	5340.00	MHL360006M	6584.00	65k	65k	25k	10k	9000	9900	AL900MA
800	MHL260008M	5991.00	MHL360008M	7236.00	65k	65k	25k	10k	9000	9900	AL900MA
1000	MHL26000M	7469.00	MHL36000M	9287.00	65k	65k	25k	10k	9000	9900	AL900MA
2000	PHF260000M	15837.00	PHF360000M	19559.00	125k	100k	65k	—	16000	N/A	N/A
2500	PCF260000M	25185.00	PCF360000M	31130.00	125k	100k	65k	—	16000	N/A	N/A

- △ UL magnetic trip tolerances are -20% / +30% from the nominal values shown.
- The withstand rating is the fault current at rated voltage that the molded case switch will withstand without damage when protected by a circuit breaker with an equal continuous current rating.

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MHL Switch



PHF/PCF Switch

3 MOLDED CASE CIRCUIT BREAKERS

**Mag-Gard® Motor Circuit Protector**

Instantaneous trip magnetic only circuit breakers have a single adjustment which simultaneously sets the magnetic trip level of each individual pole. Mag-Gard circuit breakers comply with NEC® requirements for providing motor circuit protection when installed as part of a UL Listed combination controller having motor overload protection. Interrupting ratings are established for these UL Recognized Components only when they are used in combination with motor starters with properly sized overload relays and contactors.

Mag-Gard circuit breakers will accept the same lugs and accessories as equivalent thermal-magnetic circuit breakers. Mag-Gard circuit breakers are available with I-Line construction. H-construction Mag-Gard circuit breakers are also available.

**Table 3.45: Magnetic Only LAL Mag-Gard, 400 A, 600 Vac, 50/60 Hz**

Ampere Rating	Adjustable▲ Trip Range	3P only		
		Cat. No.	\$ Price	
LAL★	400	500–1000 A	LAL3640022M	4619.00
		750–1600 A	LAL3640028M	4619.00
		1000–2000 A	LAL3640030M	4619.00
		1125–2250 A	LAL3640031M	4619.00
		1250–2500 A	LAL3640032M	4619.00
		1500–3000 A	LAL3640033M	4619.00
		1750–3500 A	LAL3640035M	4619.00
		2000–4000 A	LAL3640036M	4619.00

**Table 3.46: Magnetic Only 3–1200 A 600 Vac, 50/60 Hz**

Ampere Rating	Adjustable▲ Trip Range	3P only		
		Cat. No.	Suffix	\$ Price
FAL	3 A	FAL3600311M		906.00
	7 A	FAL3600712M		906.00
	15 A	FAL3601513M		906.00
	30 A	FAL3603013M		906.00
	30 A	FAL3603015M		906.00
	50 A	FAL3605014M		906.00
	50 A	FAL3605016M		1151.00
	100 A	FAL3610016M		1151.00
	100 A	FAL3610018M		1374.00
	100 A	FAL3615024M		1374.00
	150 A			1889.00
	MAL■★	625–1250 A		25M
750–1500 A			26M	
1000–2000 A			30M	
1500–3000 A			33M	
2000–4000 A		MAL36600	36M	7560.00
2500–5000 A		MAL36800	40M	9927.00
3000–6000 A		MAL361000	42M	12705.00
3500–7000 A			44M	
4000–8000 A			45M	
4500–9000 A			46M	
5000–10000 A		47M		
NAL■	4000–8000 A	NAL36120045M		19049.00
	4500–9000 A	NAL36120046M		19049.00
	5000–10000 A	NAL36120047M		19049.00

- ▲ UL magnetic trip setting tolerances are -20%/+30% from the nominal values shown.
- Each ampere rating can be ordered with any designated trip range for the frame by adding the proper suffix to the catalog numbers.
- ◆ Not UL Recognized.
- ★ 250 Vdc ratings are available . No UL component recognition.

Circuit Breaker	250 Vdc Multiplier
LAL	High = 1.2 Low = 1.4
MAL	High = 1.1 Low = 1.2

Accessories ..... Page 3-26—3-28  
Optional Lugs ..... Page 3-29—3-30  
Dimensions ..... Page 3-35



Adjustable instantaneous-trip circuit breakers are intended for use in combination with motor starters with overload relays for the protection of motor circuits from short circuits. Other specific applications include rectifiers and resistance welders. These circuit breakers contain a magnetic trip element in each pole with the trip point adjustable from the front. Interrupting ratings are determined by testing the instantaneous-trip circuit breakers in combination with a contactor and overload relay.

Select instantaneous-trip circuit breakers as follows:

- Use selection table for motors, other than NEMA Design E, with locked-rotor indicating code letters per NEC® Table 430.7 (b) as follows:

Horsepower	Motor Code Letters
1/2 or less	A-L
3/4 to 1-1/2	A-K
2 to 3	A-J
5 to 25	A-H
30 to 125	A-G
150 or more	A-F

For other motors order a special thermal-magnetic circuit breaker with magnetic trip settings for the specific motor— specify motor horsepower, voltage, frequency, full-load current and code letter or locked rotor current.

- Determine motor hp rating from the motor nameplate.
- Refer to the table at right and select an instantaneous-trip circuit breaker with an Ampere rating recommended for the hp and voltage involved.
- Select an adjustable trip setting of at least 800%, not to exceed 1300%, of the motor full-load Amperes. (FLA) for other than Design E motors. For Design E motors, select an adjustable trip setting of at least 1100% not to exceed 1700% of FLA.
- The NEC 1300% maximum setting may be inadequate for instantaneous-trip circuit breakers to withstand current surges typical of the magnetization current of autotransformer type reduced voltage starters, or open transition wye-delta starters during transfer from “start” to “run,” constant hp multi-speed motors, and motors labeled “high efficiency.” Select thermal-magnetic circuit breakers from Digest page 7-32 for those applications.
- Part-winding motors, per NEC® 430.3, should have two circuit breakers selected from the above at not more than one half the allowable trip setting for the horsepower rating. The two circuit breakers should operate simultaneously as a disconnecting means per NEC 430.103.

**Table 3.47: Adjustable Instantaneous-Trip L-Frame Circuit Breakers for Single Motor Circuit Protection**

Hp Ratings of Induction Type Squirrel-Cage and Wound Rotor Motors				▲ Full Load Amperes	Mag-Gard Circuit Breaker Cat. No.	Magnetic Trip Settings ♦	
3Ø 60 Hz ac						MIN	MAX
200 V	230 V	460 V	575 V				
75				221	LAL3640033M	700%	1400%
		200		240	LAL3640035M	700%	1500%
			250	242	LAL3640035M	700%	1400%
	100			248	LAL3640035M	700%	1400%
				285	LAL3640036M	700%	1400%
			300	289	LAL3640036M	700%	1400%
		250		302	LAL3640036M	700%	1300%
	125			312	LAL3640036M	600%	1300%

**Table 3.48: Adjustable Instantaneous-Trip Circuit Breakers for Single Motor Circuit Protection**

Hp Ratings of Induction Type Squirrel-Cage and Wound Rotor Motors				▲ Full Load Amperes	Mag-Gard Circuit Breaker Cat. No.	Magnetic Trip Settings ♦	
3Ø 60 Hz ac						MIN	MAX
200 V	230 V	460 V	575 V				
			1/2	0.8	FAL3600311M▲	1000%	3500%
		1/2		1	FAL3600311M▲	800%	2800%
			3/4	1.1	FAL3600311M	700%	2500%
		3/4	1	1.4	FAL3600311M	600%	2000%
		1		1.8	FAL3600311M	400%	1600%
	1/2			2	FAL3600311M	400%	1400%
			1-1/2	2.1	FAL3600311M	400%	1300%
1/2				2.3	FAL3600311M■	300%	1200%
		1-1/2		2.6	FAL3600712M	700%	2700%
			2	2.7	FAL3600712M	700%	2600%
	3/4			2.8	FAL3600712M	600%	2500%
				3.2	FAL3600712M	600%	2200%
		2		3.4	FAL3600712M	500%	2100%
	1			3.6	FAL3600712M	500%	1900%
			3	3.9	FAL3600712M	500%	1800%
1				4.1	FAL3600712M	400%	1700%
			3	4.8	FAL3600712M	400%	1500%
	1-1/2			5.2	FAL3600712M	300%	1300%
1-1/2				6	FAL3600712M■	300%	1200%
			5	6.1	FAL3600712M■	300%	1100%
	2			6.8	FAL3601513M	700%	2600%
		5		7.6	FAL3601513M	700%	2400%
2				7.8	FAL3601513M	600%	2300%
			7-1/2	9	FAL3601513M	600%	2000%
				9.6	FAL3601513M	500%	1900%
3		7-1/2	10	11	FAL3601513M	500%	1600%
		10		14	FAL3603015M	700%	2500%
	5			15.2	FAL3603015M	700%	2300%
			15	17	FAL3603015M	600%	2100%
5				17.5	FAL3603015M	600%	2000%
		15		21	FAL3603015M	500%	1700%
	7-1/2		20	22	FAL3605016M	700%	2600%
7-1/2				25.3	FAL3605016M	600%	2300%
		20	25	27	FAL3605016M	600%	2100%
				28	FAL3605016M	500%	2100%
			30	32	FAL3605016M	500%	1800%
10				32.2	FAL3605016M	500%	1800%
		25		34	FAL3605016M	400%	1700%
		30		40	FAL3605016M	400%	1500%
	15		40	41	FAL3610018M	700%	2700%
				42	FAL3610018M	700%	2600%
15				48.3	FAL3610018M	600%	2300%
		40	50	52	FAL3610018M	600%	2100%
				54	FAL3610018M	600%	2000%
20			60	62	FAL3610018M	500%	1800%
		50		65	FAL3610018M	500%	1700%
				68	FAL3610018M	400%	1600%
		60	75	77	FAL3615024M	600%	1400%
25				78.2	FAL3615024M	600%	1400%
				80	FAL3615024M	600%	1400%
			350	336	MAL3660040M	700%	1500%
125				359	MAL3660040M	700%	1400%
	150			360	MAL3660040M	700%	1400%
			300	361	MAL3660040M	700%	1400%
			400	382	MAL3660040M	700%	1300%
150		350		414	MAL3660042M	700%	1400%
			500	472	MAL3660044M	700%	1500%
		400		477	MAL3660044M	700%	1500%
	200			480	MAL3660044M	700%	1500%
200				552	MAL3680045M	700%	1400%
		500		590	MAL3680045M	700%	1400%
				602	MAL3680045M	700%	1300%

- ▲ Motor full-load currents are taken from NEC Table 430.150. Select wire and circuit breakers on basis of horsepower rather than nameplate full-load current per NEC 430.6 (A) for general motor applications. Do not use these values to select overload relay thermal units. See Digest Section 15 for selection of thermal units when actual full load current is not known. The voltages listed are rated motor voltages. Corresponding nominal system voltages are 200 to 208, 220 to 240, 440 to 480 and 550 to 600 volts.
- If due to motor starting characteristics, trip settings at the 1300% maximum permitted level are needed, the next size Mag-Gard circuit breaker should be chosen.
- ♦ Only MIN and MAX settings are shown, intermediate settings are available on all circuit breakers.



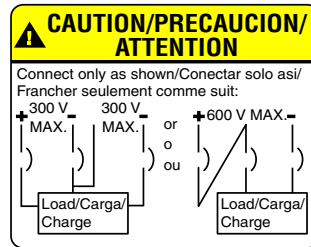
The UL Listed thermal-magnetic molded case circuit breakers shown below are specifically designed for use on ungrounded dc systems having a maximum short-circuit voltage of 500 Vdc or a maximum floating (unloaded) voltage of 600 Vdc. The circuit breakers are suitable for use only with UPS (uninterruptible power supplies) and ungrounded systems.

This two-level voltage rating allows these circuit breakers to be applied to battery sources having a short-circuit availability of 20,000 amperes for FH, KH, LH, and MH circuit breakers and 25,000 amperes for PAF circuit breakers at 500 Vdc.

FH, KH, LH and MH circuit breakers are provided with an adjustable magnetic trip that is readily accessible by means of a single adjustment on the face of the circuit breaker. PAF circuit breakers have a fixed magnetic trip range.

These circuit breakers are UL Listed for the interrupting ratings shown only if applied with three poles connected in series (series connection is external to circuit breaker). See diagram below.

**NOTE:** Due to external series connection, I-Line® circuit breakers are not available for this application.



Source = 600 Vdc max. (floating)  
500 Vdc max. (loaded)

**Table 3.49: DC Molded Case Circuit Breakers**

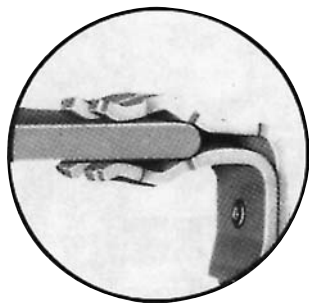
Ampere Rating	Circuit Breaker Cat. No.	Adjustable Magnetic Trip Range—DC Amperes▲		Interrupting Rating @ 500 Vdc	\$ Price	
		Low	High			
150 A	JGL37150D81	350	600	20 k AIR	3779.00	
175 A	JGL37175D81	350	600		3779.00	
200 A	JGL37200D82	500	850	20 k AIR	3779.00	
225 A	JGL37225D82	500	850		3779.00	
250 A	JGL37250D82	500	850		5001.00	
30 A	FHL3603013DC	50	180	20 k AIR	1358.00	
50 A	FHL3605014DC	75	260		1358.00	
100 A	FHL3610016DC	150	580		1541.00	
250 A	LHL3625025DC	625	1250	20 k AIR	7598.00	
300 A	LHL3630026DC	750	1500		7598.00	
350 A	LHL3635029DC	875	1750		7598.00	
400 A	LHL3640030DC	1000	2000		7598.00	
450 A	MHL3645031DC	1125	2250		9456.00	
500 A	MHL3650032DC	1250	2500	20 k AIR	9456.00	
600 A	MHL3660033DC	1500	3000		9456.00	
700 A	MHL3670035DC	1750	3500		11882.00	
800 A	MHL3680036DC	2000	4000		11880.00	
900 A	MHL3690039DC	2500	5000		14078.00	
1000 A	MHL36100040DC	2500	5000		14078.00	
1200 A	MHL36120040DC	2500	5000		25 k AIR	16758.00
<hr/>						
Ampere Rating	Circuit Breaker Cat. No.	Fixed Magnetic Trip Range—DC Amperes▲		Interrupting Rating @ 500 Vdc	\$ Price	
		Hold	Trip			
1200 A	PAF361200DC	1200	1620	25 k AIR	24726.00	
1600 A	PAF361600DC	1600	2160		24726.00	
2000 A	PAF362000DC	2000	2700		24726.00	
2500 A	PCF362500DC	2500	3375	25 k AIR	39365.00	

▲ Magnetic trip tolerances are -20%/+30% from the nominal values shown.

■ Suitable for use only in a ventilated enclosure. Minimum enclosure dimensions are 38" h x 20" w x 7" d with a minimum of 300 square inches of ventilation near the top and bottom of the enclosure.

Accessories . . . . . Page 7-36 and Supplemental Digest  
Optional Lugs . . . . . Page 7-39 and Supplemental Digest  
Dimensions . . . . . Pages 7-54 and 7-55  
Enclosures . . . . . Pages 7-56–7-58

**MOLDED CASE CIRCUIT BREAKERS**



Plug-on Connector



Bolted Connector

### Bolt-On I-Line®

(20% Price Adder)

The standard I-Line circuit breaker is designed to provide a high quality, secure connection between the distribution bus and circuit breaker. I-Line circuit breakers use plug-on type line-side connectors. The parallel line-side connectors “clamp” around the bus bars. In case of a short circuit, the increased magnetic flux causes the connectors to grasp the bus bars even tighter. I-Line circuit breakers with bolted connections have clamp-on jaws that are bolted around the main bus, as shown. The bolt-on I-Line design is offered as an alternative in order to meet specifications requiring a bolted connection. Bolt-on I-Line construction is available on FY, QB, QD, QG, QJ, Q4, FA, FH, FC, FI, KA, KH, KC, KI, LA, and LH frame circuit breakers and molded case switches, and SL100, SL225 and SL400 sub-feed lugs.

To order on all products except QB, QD, QG and QJ, simply add the letter “B” in the catalog number prefix of the circuit breaker, e.g., KA36150 becomes KAB36150. For QB, QD, QG and QJ, insert the letter “E” in the third position, e.g., QBE, QDE, etc.

### Top-Feed I-Line

(No Additional Charge)

I-Line panelboards may require the use of a top-feed I-Line circuit breaker in applications where a top-feed main circuit breaker is required. This involves having the I-Line jaw connectors on the OFF end of the circuit breaker, as opposed to the standard location on the ON end of the circuit breaker. To designate this construction, simply place the suffix “MT” at the end of the circuit breaker catalog number, e.g., KA36150 becomes KA36150MT. On LA or LH top-feed I-Line circuit breakers, accessories must be factory installed. This option is available in PowerPact® H and J-frame by placing a “K” in the 4th position (termination indicator) of the circuit breaker catalog number, e.g., HGA36125 becomes HGK36125. This option is not available on L-frame (600 A only), M-frame, N-Frame or Powerpact M-, P- and R-frame.

### “CBA” I-Line Jaw Configuration (Non-PowerPact Circuit Breaker)

(No Additional Charge)

Standard 1-pole and 2-pole I-Line circuit breakers are ordered by designating the required phase connection letters as a suffix to the circuit breaker catalog number. 3-pole circuit breakers do not require this phase designation and are supplied with an “ABC” phase jaw configuration as standard. In most applications this is acceptable since the phase loading is evenly distributed. In applications where the phases must be reversed it is possible to order a “CBA” jaw configuration by simply placing the letters “CBA” at the end of the standard catalog number, e.g., KA36150 becomes KA36150CBA.

### Control Wire Tap Lugs

(No Additional Charge if Field Installed; 20% Price Adder if Factory Installed)

Control wire tap lugs are used in applications requiring connection to a small wire (22-14 AWG) for control circuits. This is accomplished by crimping the wire to a standard wire crimp terminal (not included) and fastening the terminal to the circuit breaker lug. On KA, LA, and MA lugs, the lug is drilled to accept a 6-32 screw (included) to secure the crimp connector. On FA lugs, a flat slip-on crimp connector is used to attach to a shim-like connector placed under the circuit breaker lug.

**Note:** To order as a factory-installed device on FA, FH, FC, FI, KA, KH, KC, KI, Q4, LA, LH, LC, LI, LXI, LX, LC, MA, MH, MX, ME, MC, NA, NC, NX or NE circuit breakers, add suffix number 8041 to circuit breaker catalog number, e.g., KIL362258041. To order as a factory-installed device on MG, MJ, PG, PJ, PL, RG, RJ and RL use the product selector or the respective PowerPact catalog. Tapped lugs will be installed on the “ON” and “OFF” ends of the circuit breaker.

**Table 3.50: Control Wire Terminations for Circuit Breakers**

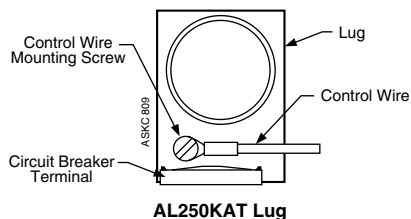
Circuit Breaker	Control Wire Termination Kits			
	Cat. No.	Standard Package Quantity	\$ Price Per Lug	Factory Installed \$ Price (Suffix 8041)
FA, FH, FC, FI	FAT▲	1	8.40	Add 20% to price of circuit breaker
KA, KH, KC	AL250KAT	1	40.80	
KI	AL250KIT	1	113.00	
Q4, LA, LH	AL400LAT	1	40.80	
LC, LI, LXI, LX, LE	AL600LI35T	1	53.00	
	AL600LI5T	1	44.60	
MA, MH, MX, ME	AL900MAT	1	111.00	
	AL1000MAT	1	111.00	
NA, NC, NX, NE	AL1200NE6T	1	228.00	

▲ Use fully-insulated 0.250 in slip-on connectors.

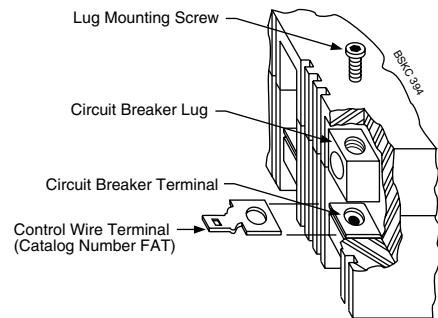
**Table 3.51: Tapped Lugs for PowerPact® Circuit Breakers**

Circuit Breaker	Amperes Max.	Kit Cat. No.	Standard Package Qty.	\$ Price Per Kit
MG, MJ, PG, PJ, PL	800 A	AL800M23TK	3	312.00
		AL800P6TK	3	458.00
PG, PJ, PL	800 A	AL800M23TK4	4	414.00
		AL800P6TK4	4	608.00
		AL1200P24TK	1	138.00
	1200 A	AL1200P25TK	3	416.00
		AL1200P25TK4	4	555.00
		AL1200R53TK■	1	237.00

■ I-Line Only.



AL250KAT Lug





**Rear-Connected Studs**



Rear-connected studs are designed to allow rear termination in applications such as control panels where wire gutter space may be limited. The studs may be bolted directly to the bus or lugs may be attached to the studs.

**NOTE:** Long and short studs must be alternated on adjacent poles to assure proper electrical clearance

Rear- Connected Studs

**Table 3.52: Rear-Connected Studs—Not UL Listed**

Circuit Breaker Cat. No. Prefix	Ampere Ratings	Stud Cat. No.	Dimensions				\$ Price Per Stud
			Overall Length	To Back of Circuit Breaker	Diameter	Threads/Inch	
FAL, FHL	15–100 A	FAS20	2-1/4 in.	2 in.	3/8 in.	16	70.00
FAL, FHL	15–100 A	FAS42	4-7/8 in.	4-1/4 in.	3/8 in.	16	92.00
KAL, KHL	70–250 A	KAS21	2-1/4 in.	2-1/8 in.	1/2 in.	13	84.00
KAL, KHL	70–250 A	KAS45	5-1/8 in.	4-5/8 in.	1/2 in.	13	129.00
LAL, LHL	125–400 A	LAS54	6-3/16 in.	5-1/2 in.	3/4 in.	16	243.00
LAL, LHL	125–400 A	LAS114	12-3/16 in.	11-1/2 in.	3/4 in.	16	360.00
MAL, MHL	300–1000 A	MAS54	6-3/16 in.	5-1/2 in.	1-1/4 in.	12	440.00
MAL, MHL	300–1000 A	MAS114	12-3/16 in.	11-1/2 in.	1-1/4 in.	12	453.00

Note: Use alternate size studs on adjacent poles to obtain proper electrical clearance.

### Special Magnetic or Thermal Calibration

(20% Price Adder)

#### Magnetic

The magnetic trip ranges for standard circuit breakers are listed in the Square D Digest. Requirements outside this range are best accommodated by selecting another standard circuit breaker. In some cases where this is not practical, a circuit breaker may be ordered with special magnetic calibration. Special magnetic calibration is not possible in all cases. Circuit breakers with special magnetic calibration and an **adjustable** magnetic trip range are **not** UL Listed; those with a **fixed** magnetic trip setting are UL Listed. Consult Square D/Schneider Electric local sales office for more information.

#### 50 Degrees C

UL 489 Listed molded case circuit breakers are calibrated for 40 degree C ambient temperature. To meet requirements of higher ambient conditions, circuit breakers can be factory calibrated for a 50 degree C ambient temperature. Circuit breakers with special thermal calibration are not UL Listed. To order 50° calibration, add "35" suffix. Consult local sales office for more information.

### Visi-Blade™ Circuit Breakers

(20% Price Adder)

Visi-blade construction is a modification to the cover of a thermal-magnetic circuit breaker, a molded case switch, or a Mag-Gard® circuit breaker which provides a "window" through which the position of the movable contacts can be verified. Luminescent paint is applied to the movable contact arms to clearly indicate their position. Gases produced during high level interruption may cause clouding of the Visi-blade window. Visi-Blade circuit breakers listed below are UL Listed except for FH circuit breakers. Visi-Blade construction is not available on circuit breakers not included in table below.



Visi-Blade Circuit Breaker

Add suffix letter "V" to the circuit breaker catalog number, i.e., FAL 36100V.

**Table 3.53: Available Visi-Blade Circuit Breakers**

Circuit Breaker Prefix	Amperes	\$ Price
FA, FH▲◆	15–100 A	20% Price Adder
KA, KH	70–250 A	
LA, LH	125–400 A	
MA, MH	300–1000 A ■	

- ▲ FH circuit breaker is not UL Listed.
- I-Line@ 800 A maximum, unit mount 1000 A maximum.
- ◆ Not available on 1P FA/FH circuit breakers.

### Moisture and Fungus Resistant Treatment for Circuit Breakers

(20% Price Adder)

This treatment covers the application of moisture and fungus resistant varnish to circuit breakers and molded case switches.

- The varnish meets Military Specification MIL-V-173C VARNISH, MOISTURE AND FUNGUS RESISTANT.
- The treatment meets military Specification MIL-T-152E TREATMENT, MOISTURE AND FUNGUS-RESISTANT, OF COMMUNICATIONS, ELECTRONIC, AND ASSOCIATED ELECTRICAL EQUIPMENT.

The treatment of circuit breakers in accordance with said specifications is intended to protect them against the moisture and fungus condition encountered in service by retarding the absorption of moisture and inhibiting the growth of fungi.

To order for F-, K-, L- and M-frame circuit breakers, place the suffix "FT" at the end of the circuit breaker catalog number, e.g., FAL36100 becomes FAL36100FT. To order for QB, QD, and QG circuit breakers, place the suffix "YF" at the end of the circuit breaker catalog number, e.g., QDL32150 becomes QDL32150YF. ED, EG, EF, GJL, PowerPact® D-, H-, J-, M-, P- and R-frame circuit breakers are inherently fungus resistant and need no further treatment.

### Short Handle for LA/LH Circuit Breakers (No Additional Charge)

Certain applications of the LA/LH circuit breakers (as mains in particular panelboards) require the use of a slightly shorter operating handle. For ordering information refer to the chart below.

**Table 3.54: Catalog Numbers for Short Handle LA/LH Circuit Breakers**

Lug Configuration Desired		Catalog "Prefix Indication"	Catalog "Suffix Indication"	Circuit Breaker Cat. No.
ON End	OFF End			
Lugs	Lugs	"L"	"MB"	LAL36400MB
No Lugs	Lugs	"P"	"MB"	LAP36400MB
Lugs	No Lugs	"P"	"MT"	LAP36400MT
No Lugs	No Lugs	"F"	"MB"	LAF36400MB

**P-Frame Replacement Handle**

Replacement handle assemblies for PA, PC, PE, PX and PH circuit breakers (produced after March 1975) are available.

**Table 3.55: P-Frame Replacement Handle**

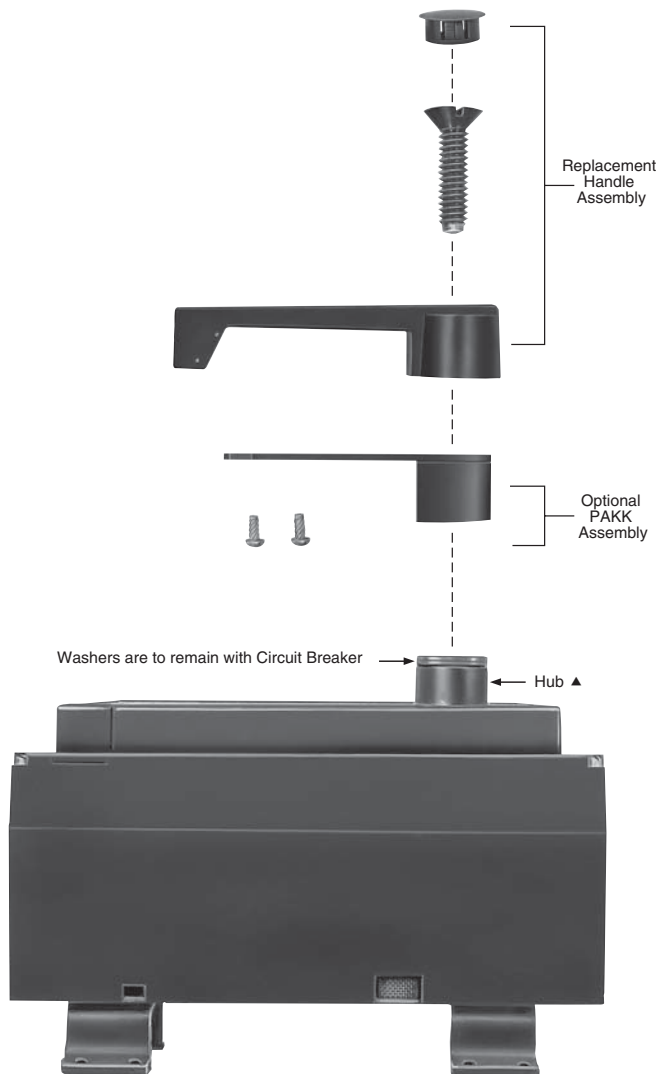
Circuit Breaker Cat. No. Prefix	Replacement Handle Cat. No.	\$ Price
PAF, PAE, PHF, PHE, PCF, PEC, PEF, PXF	HRPA	111.00

**P-Frame Key Interlock Adapter Plate**

PAKK Kit – An adapter plate that is added under the circuit breaker handle to allow mechanical interlocking with a key interlock (not included). The kit includes all the necessary hardware to mount onto the circuit breaker handle.

**Table 3.56: P-Frame Key Interlock Adapter Plate**

Cat. No.	\$ Price
PAKK	185.00



▲ The "hub" under normal conditions is insulated. When the phenolic handle is removed, a label is exposed warning of the hub being energized. That can only happen if a short circuit or severe overload occurs. The ionized gasses inside the circuit breaker could momentarily (1-2 cycles) put a high voltage potential on the hub.

**Exchange Guarantee Prices, Permanent Trip Molded Case  
Circuit Breakers**

When a Square D permanent trip circuit breaker is supplied to meet a specification requiring an interchangeable trip unit, it may be exchanged for another circuit breaker of the same type with a different trip setting.

When entering an order for the replacement circuit breaker:

1. Reference "Exchange Price Guarantee" as a line item marking on the replacement order. The replacement order will be billed at normal authorized selling net price.
2. Request Return Material Authorization referencing "Exchange Price Guarantee" and the replacement exchange price guarantee invoice number.

When the circuit breaker is returned to Cedar Rapids, credit will be issued for the difference between the replacement net price billed and the exchange list price (from the table below) times the same multiplier used on the replacement order. The list price used to determine credit will be based on the highest trip setting of the circuit breakers involved in the exchange.

**Example:** An MAL36400 (400 A trip setting) needs to be changed to an 800A trip setting. The list price for the exchange would be the exchange list price for a 700-800 A Type MA circuit breaker. If an 800A Type MA circuit breaker were being exchanged for a 400 A trip circuit breaker under this program, the list price for the exchange would still be the exchange list price shown for an 800 A Type MA circuit breaker.

**NOTE:** The Type MA circuit breaker **cannot** be exchanged for a Type LA, LH, LC or MH circuit breaker.

Only those circuit breaker types below are eligible for this exchange guarantee program.

**Table 3.57: Exchange Guarantee Circuit Breakers**

Circuit Breaker Type	Trip Range	Exchange List \$ Price
KA	70-225 A	1388.00
KA	250 A	2313.00
KH	70-225 A	3120.00
KH	250 A	4055.00
LA	All	2465.00
LH	All	4055.00
LC	All	4434.00
MA	300-600 A	3780.00
MA	700-800 A	5295.00
MA	900-1000 A	6779.00
MH	300-600 A	5043.00
MH	700-800 A	6341.00
MH	900-1000 A	7511.00

**Lug Deletion (No Additional Charge)**

In some applications, the circuit breaker does not require lugs on one or both ends. To meet this requirement, the circuit breaker should be ordered with the desired lug configuration as indicated below. If necessary, lugs may be removed in the field. However, if lugs are removed in the field, circuit breaker **Types** FH, FC, Q4 LA, LH, MA, MH, MX, ME, NA, NC, NX, and NE must be secured with pan-mounting screws, or have "P" screws (cover screws and nuts) installed securing the base to the cover.

**Table 3.58: Lug Configuration▲**

ON End	OFF End	Circuit Breaker Prefix - Suffix
Lugs	Lugs	"L" (e.g., KAL36150)
No Lugs	No Lugs	"N" (e.g., KAF36150)
No Lugs	Lugs	"P" (e.g., KAP36150)
Lugs	No Lugs	"P - MT" (e.g., KAP36150MT)

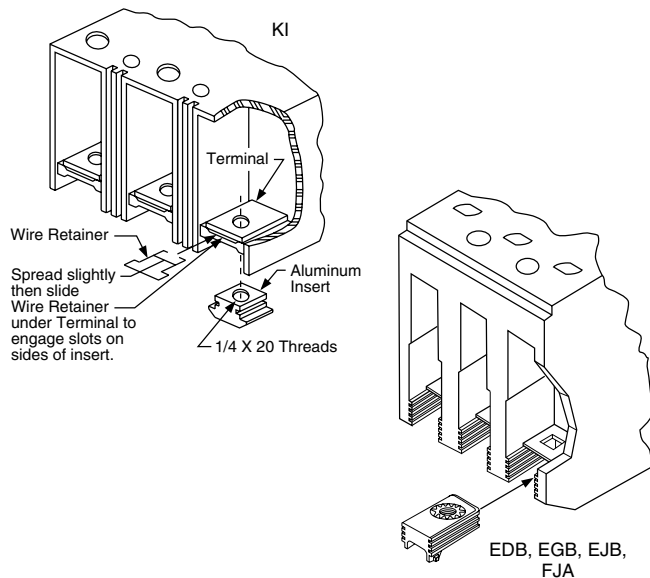
▲ See information on termination kits below  
■ MT suffix also required (except for PowerPact®).

**Termination Insert Kits**

The standard lugs supplied with KA, KH, KC, and KI (series 2 and higher), EDB, EGB, EJB, and FJA circuit breakers and molded case switches are secured by means of a screw fastened through the circuit breaker terminal into the lug body. If the standard lug is removed and a bolted connection to the circuit breaker terminal pad is desired, a threaded insert kit is required. The insert is installed below the terminal pad. For ordering information see chart below.

**Table 3.59: Termination Kit Inserts**

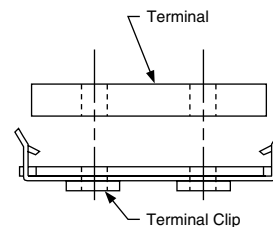
Kit Cat. No.	Inserts Per Kit	Circuit Breakers	\$ Price Per Kit
AL250KAIN	3	KA, KH, KC, KI	17.40
TIKFD	3	EDB, EGB, EJB, FJA	17.40



**3 MOLDED CASE CIRCUIT BREAKERS**

**LC, LI, LE, LX and LXI Circuit Breaker Termination Clip Kit**

The standard lugs supplied with LC, LI, LE, LX and LXI circuit breakers are secured by means of a screw fastened through the circuit breaker terminal into the lug body. If the standard lug is removed and a bolted connection to the circuit breaker terminal is desired, the AL600IN threaded terminal clip kit is required to make this connection. The AL600IN clip snaps onto the bottom of the terminal. For ordering information, see chart below.



**LC, LI, LE, LX and LXI Circuit Breakers**

**Table 3.60: Termination Clip Kit**

Kit Cat. No.	Clips Per Kit	Circuit Breakers	\$ Price Per Kit
AL600IN	3	LC, LI, LE, LX, LXI	65.00

**Electric Joint Compound**

I-Line® circuit breakers, I-Line busway plug-on units, I-Line panelboards and switchboards, QMB plug-on switches and motor control center plug-on units are supplied with factory applied joint compound on the plug-on connectors. The compound should not be removed because it contributes to the overall performance of the connection.

Whenever one of these units is removed and reinstalled, the joint compound should be reapplied. Catalog number PJC 7201 is a two-ounce container of compound specially formulated for the I-Line, QMB and motor control center connections.

No other type of commercially available joint compound should be used.



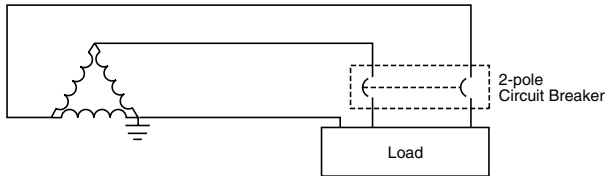
**Table 3.61: Electric Joint Compound**

Use With	Cat. No.	\$ Price
I-Line Circuit Breakers, QMB Plug-On Units, or Model-V MCC Units	PJC7201	19.80
SED Drawout Circuit Breakers	PJC8311	42.80

## Circuit Breakers for Grounded B-Phase (BØ) (Corner-Grounded Delta) Systems (No Additional Charge)

### Ordering Information For Grounded BØ Circuit Breakers

- There is no additional charge for grounded BØ circuit breakers.
- For use on 480 V systems, FH, KH, LH and MH type circuit breakers must be ordered as 600 V versions and with a 5861 suffix (i.e. FHL361005861).
- For use on 240 V systems, FH type circuit breakers may be ordered as 480 V versions with a 5861 suffix (i.e. FHL341005861).
- FA, KA, LA, and MA type circuit breakers are not available with grounded B phase markings.
- Two-pole 240 V grounded B-phase circuit breakers (except EDB, EGB, EJB, QB, QD, QG, and QJ) will be built using three-pole modules.
- Two-pole grounded BØ circuit breakers will be labeled with 240 Vac interrupting ratings. Three-pole grounded BØ circuit breakers will be labeled with 480 Vac interrupting ratings.
- No self-certification is available for interrupting ratings greater than shown in the tables below.

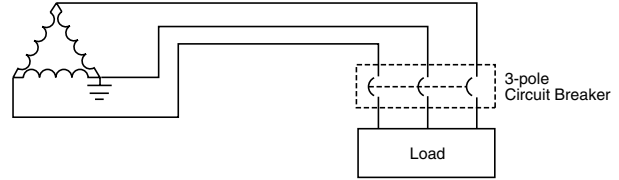


3Ø 240 Vac Corner-Grounded Delta System

**Table 3.62: Application Data for 240 Vac 3Ø Corner-Grounded Delta System**

Cat. No. Prefix	Poles	UL Listed Interrupting Rating	
		Ampere Rating	240 Vac Interrupting Rating
QO-H, QOB-H	2	15–100 A	5 kA
QB, QD, QG, QJ	2▲	70–250 A	10 kA
EDB, EGB, EJB	2▲	15–125 A	18 kA, 35 kA, 65 kA
HD, HG, HJ, HL	2▲	15–150 A	18 kA, 35 kA, 65 kA, 100 kA
JD, JG, JJ, JL	2■	150–250 A	
FH, FHL	2■	15–100 A	42 kA
KH, KHL	2■	70–250 A	
LH, LHL	2■	125–400 A	30 kA
MH, MHL	2■	300–1000 A	65 kA
MG, MJ Electronic Trip	2■◆	300–800 A	
PH	2■	2000 A	125 kA
PG, PJ, PK, PL Electronic Trip Unit	2■◆	600–1200 A	65 kA
RJ Electronic Trip Unit	2■◆	1200–2500 A	100 kA
RL Electronic Trip Unit	2■◆	1200–2500 A	125 kA
MG, MJ Electronic Trip Unit	3◆	300–800 A	65 kA
PG, PK Electronic Trip Unit	3◆	600–1200 A	
PG, PK Micrologic® Trip Unit	3◆	250–1200 A	
PJ, PL Electronic Trip Unit	3◆	600–1200 A	100 kA
PJ, PL Micrologic Trip Unit	3◆	250–1200 A	
RG, RK Electronic Trip Unit	3◆	1200–2500 A	65 kA
RG, RK Micrologic Trip Unit	3◆	600–2500 A	
RJ Electronic Trip Unit	3◆	1200–2500 A	100 kA
RJ Micrologic Trip Unit	3◆	600–2500 A	
RL Electronic Trip Unit	3◆	1200–2500 A	125 kA
RL Micrologic Trip Unit	3◆	600–2500 A	

- ▲ Standard labeling includes grounded B phase.
- Built using 3P module.
- ◆ Electronic = ET1.0 Electronic Trip System  
Micrologic = 3.0, 5.0, 3.0A, 5.0A, 6.0A, 5.0P, 6.0P, 5.0H and 6.0 H Micrologic Trip System.



3Ø 480 Vac Corner-Grounded Delta System

**NOTE:** Three-pole circuit breakers must be used on three-phase 480 V corner-grounded delta systems. The outside poles are to be connected to the ungrounded phase and the grounded conductor connected to the center pole. Connecting the circuit breaker in a manner other than that described or shown may result in an unsafe application of the circuit breaker.

**Table 3.63: 480 Vac 3Ø Corner-Grounded Delta System**

Cat. No. Prefix	Poles★	UL Listed Interrupting Rating★	
		Ampere Rating	480 Vac Interrupting Rating
HD, HG, HJ, HL	3	15–150 A	18 kA, 35 kA, 65 kA, 100 kA
JD, JG, JJ, JL	3	150–250 A	
FH, FHL	3	15–100 A	10 kA
KH, KHL	3	70–250 A	14 kA
LH, LHL	3	125–400 A	14 kA
MH, MHL	3	300–1000 A	18 kA
MG, MJ Electronic Trip Unit	3▼	300–800 A	35 kA
PH	3	2000 A	25 kA
PG, PK Electronic Trip Unit	3▼	600–1200 A	35 kA, 65 kA
PG, PK Micrologic Trip Unit	3▼	250–1200 A	
PJ, PL Electronic Trip Unit	3▼	600–1200 A	65 kA, 100 kA
PJ, PL Micrologic Trip Unit	3▼	250–1200 A	
RG, RJ, RK, RL Electronic Trip Unit	3▼	1200–2500 A	35 kA, 65 kA, 100 kA
RG, RJ, RK, RL Micrologic Trip Unit	3▼	600–2500 A	
NT	3	800–1200 A	100 kA
NW	3	800–6000 A	150 kA

- ★ The grounded phase should be connected through the center pole only.
- ▼ Electronic = ET1.0 Electronic Trip System  
Micrologic = 3.0, 5.0, 3.0A, 5.0A, 6.0A, 5.0P, 6.0P, 5.0H and 6.0 H Micrologic Trip System.

These circuit breakers with the properly selected trip range provide protection for trailing cables in compliance with the Federal Register for Mining Applications.

The thermal-magnetic circuit breakers listed below have thermally-responsive trip elements in addition to adjustable instantaneous trip mechanisms. They allow for independent selection of thermal and magnetic trip characteristics. See selection chart below. For Mag-Gard® instantaneous trip magnetic-only circuit breakers refer to Digest.

**Table 3.64: Circuit Breakers for Mining Applications**

Adjustable Magnetic Trip Range▲		Cat. No.	\$ Price
Low	High		
50 A	180 A	FAL3603013T	996.00
75 A	260 A	FAL3605014T	996.00
150 A	580 A	FAL3610016T	1226.00
500 A	1000 A	LAL3612522T	4619.00
		LAL3615022T	4619.00
		LAL3617522T	4619.00
		LAL3620022T	4619.00
		LAL3622522T	4619.00
1000 A	2000 A	LAL3625022T	4619.00
		LAL3620030T	4619.00
		LAL3622530T	4619.00
		LAL3625030T	4619.00
		LAL3630030T	4619.00
1250 A	2500 A	LAL3635030T	4619.00
		LAL3640030T	4619.00
		LAL3625032T	4619.00
		LAL3630032T	4619.00
		LAL3635032T	4619.00
1500 A	3000 A	LAL3640032T	4619.00
		LAL3630033T	4619.00
		LAL3635033T	4619.00
1750 A	3500 A	LAL3640033T	4619.00
		LAL3635025T	4619.00
		LAL3640035T	4619.00

**Table 3.65: Circuit Breakers for Mining Applications**

Adjustable Magnetic Trip Range▲		Cat. No.	\$ Price
Low	High		
750 A	1500 A	MAL3630026T	7560.00
		MAL3635026T	7560.00
1000 A	2000 A	MAL3630030T	7560.00
		MAL3635030T	7560.00
		MAL3640030T	7560.00
		MAL3645030T	7560.00
		MAL3650030T	7560.00
1250 A	2500 A	MAL3635032T	7560.00
		MAL3640032T	7560.00
		MAL3645032T	7560.00
		MAL3650032T	7560.00
		MAL3660032T	7560.00
1500 A	3000 A	MAL3630033T	7560.00
		MAL3635033T	7560.00
		MAL3640033T	7560.00
		MAL3645033T	7560.00
		MAL3650033T	7560.00
2000 A	4000 A	MAL3660033T	7560.00
		MAL3670033T	9927.00
		MAL3680033T	9927.00
		MAL3640036T	7560.00
		MAL3645036T	7560.00
2500 A	5000 A	MAL3650036T	7560.00
		MAL3660036T	7560.00
		MAL3670036T	9927.00
		MAL3680036T	9927.00
		MAL3690036T	12705.00
3000 A	6000 A	MAL3640040T	12705.00
		MAL3650040T	7560.00
		MAL3660040T	7560.00
		MAL3670040T	9927.00
		MAL3680040T	9927.00
3500 A	7000 A	MAL3690040T	12705.00
		MAL36100040T	12705.00
		MAL3660042T	7560.00
		MAL3670042T	9927.00
		MAL3680042T	9927.00
4000 A	8000 A	MAL3690042T	12705.00
		MAL36100042T	12705.00
		MAL3680044T	9927.00
		MAL3690044T	12705.00
		MAL36100044T	12705.00
4500 A	9000 A	MAL3680045T	9927.00
		MAL3690045T	12705.00
		MAL36100045T	12705.00
		MAL3690046T	12705.00
		MAL36100046T	12705.00

▲ Magnetic trip setting tolerances are -20% and +30% from nominal values shown.

**UL Marine Listed Circuit Breakers**

A standard for molded case circuit breakers which are intended to be installed and used aboard a boat or vessel is included in Supplement SA to UL 489, "Standard for Molded Case Circuit Breakers and Circuit Breaker Enclosures" (also referred to as UL product category DKTY). This UL Standard was established in accordance with U.S. Coast Guard regulations, applicable American Boat and Yacht Council Inc. publications, and NFPA® 302 "Standard for Motor Craft (Pleasure and Commercial)". In order to be UL Listed for marine use, circuit breakers must not use aluminum or aluminum alloys for terminal connections and must be calibrated at an ambient temperature of 40 °C. Standard circuit breakers should not be specified or used in place of marine circuit breakers.

The following table lists those circuit breakers which are UL Marine Listed for use on vessels over 65 ft. (19.8 m) in length. (PowerPact H and J-frame circuit breakers can also be used in vessels under 65 ft. [19.8 m] in length.)

**Table 3.66: Circuit Breakers for Marine Applications**

Cat. No. Prefix	Poles	Ampere Rating	Application	Cat. No.	\$ Price
FA, FAL	2 3	15-100 A 15-100 A	For use only on vessels over 65 feet (19.8 m) in length.	Add the number "9" after the catalog number prefix of the standard circuit breaker catalog number.  Example: Standard FAL36100 Marine FAL936100	There is a 20% adder to the price of the equivalent standard circuit breaker. All marine circuit breakers are supplied with copper lugs.
FH, FHL	2, 3	15-100 A			
FI, FIL	2, 3	20-100 A			
KI, KIL	2, 3	110-250 A			
LA, LAL	2, 3	125-400 A			
LH, LHL	2, 3	125-400 A			
MA, MAL	2, 3	300-1000 A			
MH, MHL	2, 3	300-1000 A			
ME, MEL, MX, MXL	2, 3	100-800 A			
NA, NE, NC, NX					
NAL, NCL, NEL, NXL	2, 3	600-1200 A			
PAF	2, 3	600-2000 A			
PHF	2, 3	600-2000 A			
PCF	2, 3	1600-2500 A			
PE, PEF, PX, PXF	2, 3	600-2000 A			
PowerPact® HD, HG, HJ, HL	2, 3	15-150 A	For use on vessels over and under 65 feet (19.8 m) in length.	Add a "YA" after the standard circuit breaker catalog number.	
PowerPact JD, JG, JJ, JL	2, 3	150-250 A	For use only on vessels over 65 feet (19.8 m) in length.	Example: Standard HGL36100 Marine HGL36100YA	
PowerPact MG, MJ	2, 3	300-800 A			
PowerPact PG, PJ, PL	2, 3, 4	100-1200 A			
PowerPact RG, RJ, RL	2, 3, 4	600-2500 A			

For use on vessels over 65 ft. (19,8 m) in length  
Para utilizarse en embarcaciones mayores a 65 pies (19,8 m) de longitud  
À utiliser sur des navires ayant plus de 65 pi (19,8 m) de long



**UL Naval Listed Circuit Breakers**

A standard for molded case circuit breakers which are intended or use aboard non-combatant and auxiliary naval ships is included in Supplement SB to UL 489, "Standard for Molded Case Circuit Breakers and Circuit Breaker Enclosures". The following table lists those circuit breakers which are UL Naval Listed for use on vessels under 65 feet (19.8 m) in length.

**Table 3.67: Circuit Breakers for Navel Applications**

Cat. No. Prefix	Poles	Ampere Rating	Application	Cat. No.	\$ Price
HD, HG, HJ, HL	2, 3	15-150 A	For use on non-combat and auxiliary naval ships over and under 65 feet (19.8 m) in length.	Add a "YA" after the standard circuit breaker catalog number.  Example: Standard HGL36100 Marine HGL36100YA	There is a 20% adder to the price of the equivalent standard circuit breaker. All marine circuit breakers are supplied with copper lugs.
JD, JG, JJ, JL	2, 3	150-250 A			

**Factory-Installed Electrical Accessories**

Electrical accessories are available on all molded case circuit breakers except FY and QOM1 circuit breakers.

- Alarm switch is the only accessory available for the 1-pole FA circuit breaker.
- Combination accessories may be ordered by description, i.e., 1021 and 1212.
- All AC electrical accessories shown below are rated for 50/60 Hz.
- Add 20% to accessory price for each field-installable accessory that is factory-installed.
- See page 3-27 for field-installable accessories. See Digest page 7-35 for PowerPact® circuit breaker accessories.

**1A Alarm Switch Configuration**

Color Code: Red Leads



Circuit Breaker Open or Closed



Circuit Breaker Tripped

**1B Alarm Switch Configuration**

Color Code: Red Leads



Circuit Breaker Tripped

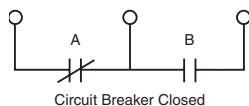


Circuit Breaker Open or Closed

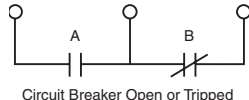
**Auxiliary Switch Contact Configuration**

Color Code:  
"A" Contact - Yellow Leads  
"B" Contact - Blue Leads  
Common-Striped Leads

1A/1B



Circuit Breaker Closed



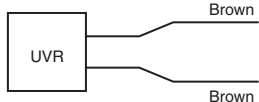
Circuit Breaker Open or Tripped

**Table 3.68: Factory-Installed Accessories for Thermal-Magnetic Circuit Breakers**

Accessory	Description	Rated Voltage	Coil Burden▲	Suffix	\$ Price Adder						
Shunt Trip	Trips the circuit breaker from a remote location by means of a trip coil energized from a separate circuit. A 120 V shunt trip will operate at 55% or more of rated voltage. All other shunt trips will operate at 75% or more of rated voltage.  <b>Application</b> <ul style="list-style-type: none"> <li>• For use with momentary or maintained push button.</li> <li>• Sure Trip Capacitor Unit requires 48 Vdc shunt trip.</li> <li>• Leads: (2) Black 18 AWG Cu.</li> </ul>	24 Vac	21 VA	-1042■	755.00						
		120 Vac	24 VA	-1021♦	755.00						
		208 Vac	107 VA	-1021	755.00						
		240 Vac	154 VA	-1021	755.00						
		277 Vac	14 VA	-1037■	755.00						
		480 Vac	45 VA	-1037■	755.00						
		24 Vdc	36 VA	-1027	755.00						
		48 Vdc	36 VA	-1028	755.00						
		125 Vdc	44 VA	-1029	755.00						
		250 Vdc	15 VA	-1030★	755.00						
Ground-Fault Shunt Trip	Trips the circuit breaker electrically using the signal from a Micrologic® Ground-Fault Module.  <b>Application</b> <ul style="list-style-type: none"> <li>• For use only with obsolete GP Ground-Censor® system or add on ground-fault module.</li> <li>• Leads: (2) Orange 18 AWG Cu.</li> </ul>	—	—	-G★	755.00						
Undervoltage Trip (UVR)	Trips the circuit breaker electrically when a control circuit falls below 35 to 70% of nominal (not field adjustable). Picks up at 35–85% of nominal voltage.  <b>Application</b> <ul style="list-style-type: none"> <li>• UVR must be energized in order to close the circuit breaker.</li> <li>• Leads: (2) Brown 18 AWG Cu leads.</li> </ul>	24 Vac 120 Vac 240 Vac 24 Vdc 48 Vdc	5 VA 8 VA 8 VA 2 VA 3 VA	-1143★ -1121♦ -1124 -1127 -1128	755.00 755.00 755.00 755.00 755.00						
Time Delay Unit	Provides adjustable time delay for UVR of 0.1 to 0.6 second before circuit breaker trips.  <b>Application</b> <ul style="list-style-type: none"> <li>• For use only with -1121 UV trip.</li> <li>• Adjustable time delay (0.1 to 0.6 second).</li> <li>• I-Line unit requires 1.5 in. (38 mm) of mounting space.</li> <li>• Leads: (2) Brown 18 AWG Cu and (2) Black/White 18 AWG Cu.</li> </ul>	120 Vac		<table border="1"> <thead> <tr> <th colspan="2">Cat. No.</th> </tr> <tr> <th>Unit Mt.</th> <th>I-Line®</th> </tr> </thead> <tbody> <tr> <td>690UVTD</td> <td>690UVTDI</td> </tr> </tbody> </table>	Cat. No.		Unit Mt.	I-Line®	690UVTD	690UVTDI	1941.00
Cat. No.											
Unit Mt.	I-Line®										
690UVTD	690UVTDI										
Auxiliary Switches	Monitors circuit breaker contact status and provides a remote signal indicating the circuit breaker contacts are OPEN or CLOSED.  <b>Application</b> <ul style="list-style-type: none"> <li>• Max. Load = FA, FH, FC, FI, KA, KH, LC, LE, LI, LX, LXI.</li> <li>• 10 A @ 125–250 Vac, ¼ hp @ 125–250 Vac, 5 A @ 30 Vdc</li> <li>• Leads: Yellow for "A", Blue for "B", Striped for common 18 AWG Cu.</li> </ul>	1A/1B 2A/2B 3A/3B	See load info. in App. text at left	-1212 -1352 -1364▼	312.00 623.00 800.00						
Alarm Switches	Used with control circuits and actuated only when the circuit breaker has tripped. Standard construction includes a normally-open contact.  <b>Application</b> <ul style="list-style-type: none"> <li>• Max. Load = 10 A @ 125–250 Vac</li> <li>• Max. Load = 15 A @ 30 Vdc</li> <li>• Leads: (2) Red 18 AWG Cu.</li> </ul>	1A 1A 1B 1B	250 Vac 28 Vdc 250 Vac 48 Vdc	See load info. in App. text at left	312.00 312.00 312.00 312.00						

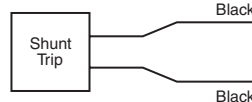
- ▲ Coil burden values do not apply to LC, LE, LI, LX and LXI. Consult Field Sales office for more information.
- Not available on FI, KI or KC circuit breakers.
- ♦ LC, LE, LI, LX, and LXI circuit breakers operate at 75% or more of rated voltage.
- ★ Not available on LC, LE, LI, LX, LXI circuit breakers.
- ▼ Not available in FA, FC, FH, FI and KI circuit breakers.

**Undervoltage Trip Wiring Diagram**



Brown Wires To Be Connected To Control Power

**Shunt Trip Wiring Diagram**



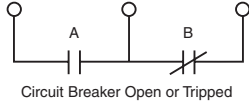
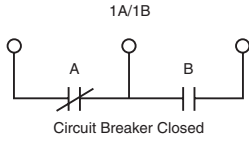
Black Wires To Be Connected To Control Power

690UVTD Wiring Diagram



**Auxiliary Switch  
Contact Configuration**

Color Code:  
"A" Contact - Yellow Leads  
"B" Contact - Blue Leads  
Common-Striped Leads



**1A Alarm Switch  
Configuration**

Color Code: Red Leads

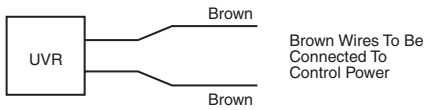


**1B Alarm Switch  
Configuration**

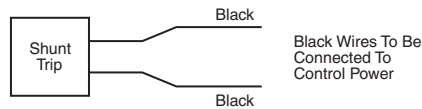
Color Code: Red Leads



**Undervoltage Trip  
Wiring Diagram**



**Shunt Trip  
Wiring Diagram**



**Field-Installable Electrical Accessories**

Complete field-installable accessory catalog number by inserting suffix from 3-26 between the parentheses in the catalog numbers shown in the table below. (Example: NA11212) See 3-26 for accessory pricing; add 20% to factory-install field-installable devices.

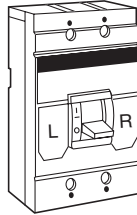
**Table 3.69: Field-Installable Accessories for Thermal-Magnetic and Electronic Trip Circuit Breakers**

Circuit Breaker	Shunt Trip	Ground-Fault Shunt Trip ■	Undervoltage Trip	Auxiliary Switches	Alarm Switch
Miniature Circuit Breakers, EH and EH-PL	Factory-Installed Only	Not Available	Not Available	Factory-Installed Only	Factory-Installed Only
FA, FH, FC, FI, KA, KH, KC, KI	Factory-Installed Only	Factory-Installed Only	Factory-Installed Only	Factory-Installed Only	Factory-Installed Only
LA, LH Series 4 ♦	LA1( )	LA1G	LA1( )	LA1( )	Factory-Installed Only Right Pole
Q4	LA1( )	LA1G	LA1( )	LA1( )	Factory-Installed Only Right Pole
LC, LE, LI, LX, LXI	LC1( )	LC1G	LC1( )	LC1( )	Factory-Installed Only
MA, MH Series 2	MA1( )	MA1G	MA1( )	MA1( )	Factory-Installed Only Center Pole
ME, MX	Factory-Installed Only	Factory-Installed Only	Factory-Installed Only	Factory-Installed Only	Factory-Installed Only
NA, NC, NE, NX Series 1, 2, 3	NA1( )	NA1( )	NA1( )	NA1( )	NA1( )
PA, PH, PC Series 4	PA1( )	Factory-Installed Only	PA1121 PA1124	PA1( )	Factory-Installed Only
PE, PX Series 4, 5, 6	PA1( )	Factory-Installed Only	PA1121 PA1124	PA1( )	Factory-Installed Only

- ▲ Combination accessory in right pole with factory-installed alarm switch must also be factory-installed on MA circuit breakers.
- Used with obsolete GP Ground-Censor® system or add-on ground-fault modules.
- ♦ With LA and LH top-feed circuit breakers (suffix MT, I-Line jaws on OFF end) all accessories must be factory installed.

Complete field-installable accessory catalog number by inserting suffix from 3-26 between the parentheses in the catalog numbers shown in the table below. (Example: NA11212) See 3-26 for accessory pricing; add 20% to factory-install field-installable devices.

**Table 3.70: Accessory Mounting Locations**



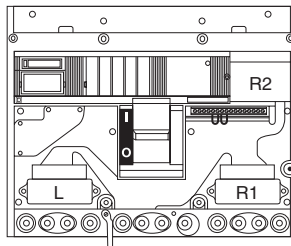
LA, LH, Q4 Series 4 circuit breakers or newer = Field-installable accessories

LC, LI, LX, LXI circuit breakers = Field-installable accessories

MA, MH Series 2 circuit breakers or newer = Field-installable accessories

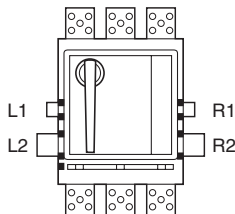
ME/MX circuit breakers = Not field-installable accessories

Both accessory ports will accept shunt trips, UVRs and auxiliary switches. Alarm switches are factory installable only (right pole). Maximum of one device per port.



NA, NC, NE, NX circuit breakers - Field-installable accessories

"L" port and "R" port will accept shunt trips, alarm switches and UVRs; "R2" port will accept auxiliary switches. Maximum of one device per port.



PA, PH, PC, PE, PX Series 4 circuit breakers or newer = Field-installable accessories.

"L1" and "L2" or "R1" and "R2" port combinations are required to mount a single shunt trip. Both "L2" and "R2" ports will accept a UVR. Both "L1" and "R1" ports will accept auxiliary switches. If alarm switch is factory installed in PA or PC circuit breaker, it will be installed in "R2" port. For a PE or PX circuit breaker, the alarm switch will be factory installed in "L2" port.

**3 MOLDED CASE CIRCUIT BREAKERS**



KAMO2120AC  
With KAL Circuit Breaker



FAMO1 and FAMOP  
With FAL Circuit Breaker

### Electrical Operators

Provides remote ON, OFF/RESET control of molded case circuit breakers.

- A complete line of field-installable electrical operators.
- Not applicable on LC/LI/LE/LX/LXI, ME/MX, or NA/NC/NE/NX circuit breakers.
- Installing side mounted motor operators on non I-Line® circuit breakers requires the use of a separate mounting pan.
- Side mounted electrical operators require an additional 4-1/2 in. (114 mm) of mounting space in I-Line installations.

When remote indication of circuit breaker status is required, order circuit breaker with 1A-1B auxiliary switch for ON-OFF Indication and alarm switch for TRIP Indication. Electrical operators require SPDT maintained contact switch. Refer to Class 9001 control unit listing for operators and pilot lights.

**NOTE:** Not available on Mag-Gard® circuit breakers and molded case switches.

**Table 3.71: Electrical Operators**

Circuit Breaker Prefix	Top Mount			Side Mount			Mounting Pan	
	Voltage	Cat. No.	\$ Price	Voltage	Cat. No.	\$ Price	Cat. No.	\$ Price
FA, FH, FC	—	—	—	120 Vac	FAMO1	1304.00	—	—
FAL, FHL, FCL	—	—	—	120 Vac	FAMO1	1304.00	FAMOP	108.00
FI, KA, KH, KC, KI	—	—	—	120 Vac	KAMO1	3506.00	—	—
FIL, KIL, KAL, KHL, KCL	120 Vac	KAMO2120AC	3642.00	120 Vac	KAMO1	3506.00	KAMOP	134.00
	240 Vac	KAMO2240AC	3642.00					
	24 Vdc	KAMO224DC	3642.00					
	125 Vdc	KAMO2125DC	3642.00					
LA, LH, Q4	—	—	—	120 Vac	LAMO1	4518.00	—	—
LAL, LHL, Q4L	120 Vac	LAMO2120AC	4704.00	120 Vac	LAMO1	4518.00	LAMOP	185.00
	240 Vac	LAMO2240AC	4704.00					
	24 Vdc	LAMO224DC	4704.00					
	125 Vdc	LAMO2125DC	4704.00					
MA, MH	—	—	—	120 Vac	MAMO1	4518.00	—	—
MAL, MHL	120 Vac	MAMO2120AC	4704.00	120 Vac	MAMO1	4518.00	MAMOP	1856.00
	240 Vac	MAMO2240AC	4704.00					
	24 Vdc	MAMO224DC	4704.00					
	125 Vdc	MAMO2125DC	4704.00					
PA, PH, PC, PE, PX	120 Vac	PAMO2	5544.00	—	—	—	—	—

### Handle Accessories

**Table 3.72: Handle Accessories**

Circuit Breaker Prefix	Poles	Cat. No.	\$ Price
<b>Handle Tie</b>			
(2)FA	3	FKHT	215.00
(2)KA, (2)FI, (2)KI, or (1)FI + (1)KI	2,3	FKHT	215.00
(2)LA or (2)Q4	2,3	LAHT	497.00
<b>California Title 24 Comb. Handle Tie and Lock Off</b>			
FY	(3)1P	FY3HT	53.00
FA	(3)1P	FA3HT	53.00
<b>Handle Extension</b>			
LA, LC, LH, LE, LI, LX, LXI, Q4	2,3	AHEXLI	95.00
MA, MH, ME, MX, NA, NC, NE, NX	2,3	MAHEX	95.00

- ▲ Locks OFF only.
- MA and MH circuit breakers will not lock in ON position
- ◆ Use with MAHEX handle extension.

Circuit Breaker Prefix	Poles	Cat. No.	\$ Price
<b>Handle Padlock Attachment (locks ON or OFF)</b>			
FY Series 1	1	HPAFYQ	19.80
FA, FH, FC, FI	1,2,3	HPAFK	24.20
FY Series 2, KA, KH, KC, KI	2,3	HPAFK	24.20
	2,3	HPAFK▲	32.60
LA, LH, Q4, MA, MH, ME, MX	2,3	HPALM■ HPAXLM◆	26.00 27.60
LC, LE, LI, LX, LXI	2,3	AHPALI	25.20
NA, NC, NE, NX	2,3	HPANE	26.00
PA, PC, PH, PE, PX	2,3	PAPAF	119.00

### Cylinder Lock

Used to lock the circuit breaker in the OFF position. Circuit breaker cannot be reset when locked OFF.

**Table 3.73: Cylinder Lock**

Circuit Breaker Prefix	Factory Installed Suffix	Field Installable Cat. No.	\$ Price
FA, FAL, FH, FHL★	—CL	Factory-installed only	315.00
KA, KAL, KH, KHL★			315.00
LA, LAL, LH, LHL, Q4	Field-installable only	LA1CL	315.00
MA, MAL, MH, MHL		MA1CL	315.00

★ Not available on Mag-Gard circuit breakers and molded case switches.

### Interlocks

**Table 3.74: Walking Beam Mechanical Interlock Components▼**



Walking Beam Mechanical Interlock  
Requires 2 circuit breakers with WB suffix,  
1 walking beam assembly and 1 mounting pan.

Circuit Breaker Prefix	Manually Operated						Electrically Operated					
	Operator Suffix	\$ Price Adder	Walking Beam Ass'y.		Mounting Pan		Operator Suffix	\$ Price Adder	Walking Beam Ass'y.		Mounting Pan	
			Cat. No.	\$ Price	Cat. No.	\$ Price			Cat. No.	\$ Price	Cat. No.	\$ Price
FAL, FHL	WB	246.00	FA4WB	134.00	FAWBP4	177.00	WBMO	246.00	FA9WB	200.00	FAWBP9	242.00
LAL, LHL	WB	246.00	LA6WB	179.00	LAWBP6	242.00	WBMO	246.00	LA10WB	213.00	LAWBP10	309.00
MAL, MHL	WB	246.00	MA9WB	215.00	MAWBP9	309.00	WB	246.00	MA13WB	251.00	MAWBP13	429.00

▼ Fully enclosed interlocked units are available in Type 1 and Type 3R enclosures, with two neutrals provided in each enclosure. The completely enclosed assembly is not UL Listed. Please consult your nearest Square D/Schneider Electric local sales office for more information.



**Table 3.75: Mechanical Lug Kit Information**

Circuit Breaker Application				(Number of Wires Per Lug ) Wire Range <sup>A</sup>	Cat. No.	Lugs Per Kit	\$ Price Per Kit
Standard	Ampere Rating	Optional	Ampere Rating				
<b>Al Lugs for Use with Al or Cu Wire</b>							
FA, FH FI	15-30 A	FA, FH FI	35-100 A	(1) 14-4 AWG Cu or (1) 12-4 AWG Al	AL50FA	3	37.20
FC	35-100 A	FC	15-30 A	(1) 14-3 AWG Cu or (1) 12-1 AWG Al	AL100FA4	3	37.20
FA, FH FI	35-100 A	FA, FH FI	15-30 A	(1) 14-1/0 AWG Cu or (1) 12-1/0 AWG Al	AL100FA	3	37.20
—	—	FA, FH, FC	15-100 A	(1) 12-3 AWG Cu	AL100TF■	3	37.20
—	—	FA	150 A (only)	(1) 2-3/0 AWG	AL150FA	3	37.20
KA, KH	70-250 A	—	—	(1) 4 AWG-350 kcmil	AL250KA	3	113.00
KI, KC	110-175 A	—	—	—	—	—	—
KI, KC	200-250 A	KI	110-175 A	(1) 1/0 AWG-350 kcmil	AL250KI	3	107.00
KD, KG	100-250 A	—	—	(1) 6 AWG-350 kcmil	AL250KD	3	107.00
Q4, LA, LH	125-400 A	—	—	(1) 1 AWG-600 kcmil or (2) 1 AWG-250 kcmil	AL400LA	1	35.70
—	—	Q4, LA, LH	125-400 A	(1) 350-750 kcmil	AL400LH7	1	47.10
LE, LX, LXI	100-250 A	LC, LI, LE, LX, LXI	300-600 A	(2) 1 AWG-350 kcmil	AL600LI35	1	49.60
LC, LI, LE, LX, LXI	300-600 A	LE, LX, LXI	100-250 A	(2) 4/0 AWG-500 kcmil	AL600LI5	1	47.10
—	—	LC, LI, LE, LX, LXI	—	(1) 500-750 kcmil	AL600LI7	1	53.00
MA, MH	300-1000 A	—	—	(3) 3/0 AWG-500 kcmil	AL900MA	1	95.00
—	—	MA, MH	300-1000 A	(2) 500-750 kcmil	AL800MA7	1	192.00
—	—	MA, MH	300-1200 A	(4) 1/0 AWG-350 kcmil	AL1000MA	1	95.00
ME, MX	100-250 A	—	—	(1) 6 AWG-350 kcmil	AL250ME	3	472.00
—	—	ME, MX	250-400 A	(1) 350-750 kcmil	AL400ME7	1	300.00
—	—	ME, MX	100-800 A	(2) 500-750 kcmil	AL800MA7	1	192.00
ME, MX	300-800 A	ME, MX	100-250 A	(3) 3/0 AWG-500 kcmil	AL900MA	1	95.00
—	—	ME, MX	300-1200 A	(4) 1/0 AWG-350 kcmil	AL1000MA	1	95.00
NA, NC, NE, NX	600-1200 A	—	—	(4) 3/0 AWG-600 kcmil	AL1200NE6	1	215.00
—	—	PAF, PHF, PEF, PXF, PCF	600-2500 A	(1) 1/0 AWG-750 kcmil	AL2500PA	2	132.00
<b>Cu Lugs for Use with Cu Wire Only ♦</b>							
FC	15-30 A	—	—	(1) 14-10 AWG Cu	CU30FA4	3	37.20
—	—	FA, FH, FC, FI	15-100 A	(1) 14-1 AWG Cu	CU100FA	3	37.20
—	—	FA, FH, FC	15-100 A	(1) 12-3 AWG Cu	CU100TF■	3	62.00
—	—	KA, KH	70-250 A	—	—	—	—
—	—	KC, KI	110-250 A	(1) 4 AWG-250 kcmil Cu	CU250KA	3	113.00
—	—	Q4, LA, LH	125-400 A	(1) 1 AWG-600 kcmil Cu or (2) 1 AWG-250 kcmil Cu	CU400LA	1	70.00
—	—	LC, LI, LE, LX, LXI	—	(2) 1 AWG-350 kcmil Cu	CU600LI35	1	230.00
—	—	LC, LI, LE, LX, LXI	—	(2) .4/0 AWG-500 kcmil Cu	CU600LI5	1	230.00
—	—	LC, LI, LE, LX, LXI	—	(1) 500-750 kcmil Cu	CU600LI7	1	230.00
KD, KG	100-250 A	—	—	(1) 6 AWG-350 kcmil Cu	CU250KD	3	134.00
—	—	MA, MH	300-1000 A	(3) 3/0 AWG-500 kcmil Cu	CU1000MA	1	299.00
—	—	ME, MX	125-250 A	(1) 4 AWG-250 kcmil Cu	CU250ME	3	732.00
—	—	ME, MX	100-800 A	(3) 3/0 AWG-500 kcmil Cu	CU1000MA	1	299.00
—	—	NA, NC, NE, NX	600-1200 A	(4) 3/0 AWG-600 kcmil Cu	CU1200NE6	1	598.00

- ▲ Unless otherwise specified, wire sizes apply to both aluminum and copper conductors.
- For use in the OFF end only, when the OFF end is the load end.
- ♦ Use suffix 8002 for factory-installed Cu lugs. (20% adder.)

Compression Lug Kits

Table 3.76: Field-installable Compression Lug Kits▲

Circuit Breaker Type	Wire Range ♦	Dimension A (In)	Max. Lugs Per Terminal	Cat. No.	Lug Qty. Per Kit	\$ Price Per Kit
<b>Aluminum Compression Lug Kits</b>						
FA, FH, FC, FI	8-1/0 AWG	1.3	1	VC100FA	3	175.00
KA, KH, KC, KI	4 AWG-300 kcmil	1.5	1	VC250KA3	3	255.00
	250-350 kcmil	1.5	1	VC250KA35	3	194.00
LA, LH, Q4	250-350 kcmil	1.25	2	VC400LA35	2	194.00
	4 AWG-300 kcmil	1.0	2	VC400LA3	2	202.00
	2/0 AWG-500 kcmil	2.2	1	VC400LA5	1	166.00
	500-750 kcmil	2.5	1	VC400LA7	1	198.00
LC, LI, LE, LX, LXI ■	4 AWG-300 kcmil	1.05	2	VC600LI3	2	295.00
	2/0 AWG-500 kcmil	3.20	2	VC600LI5	2	308.00
	500-750 kcmil	3.45	1	VC600LI7	1	311.00
MA, MH	2/0 AWG-500 kcmil	1.9	2	VC600MA5	2	293.00
	500-750 kcmil	2.1	2	VC800MA7	2	312.00
ME2, MX2	4 AWG-300 kcmil	1.5	1	VC250ME3	3	823.00
	250-350 kcmil	1.5	1	VC250ME35	3	194.00
ME4, MX4	2/0 AWG-500 kcmil	2.2	1	VC400ME5	1	379.00
	500-750 kcmil Al or 500 kcmil Cu	2.5	1	VC400ME7	1	412.00
ME, MX, MA, MH	2/0 AWG-500 kcmil	1.9	2	VC600MA5	2	293.00
	500-750 kcmil Al or 500 kcmil Cu	2.1	2	VC800MA7	2	312.00
NA, NC, NE, NX	2/0 AWG-500 kcmil	3.3	4	VC1200NE5	4	942.00
	500-750 kcmil Al or 500 kcmil Cu	3.6	4	VC1200NE7	4	942.00
PAF, PHF, PCF, PEF	2/0 AWG-500 kcmil	★	6-8	VC2500PA5	4	96.00
	2/0 AWG-500 kcmil	★	6-8	VC2500PA7	4	194.00
<b>Copper Compression Lug Kits</b>						
FA, FH, FC, FI	6-1/0 AWG Cu	1.4	1	CVC100FA	3	156.00
KA, KH, KC, KI	2/0 AWG-300 kcmil Cu	1.5	1	CVC250KA3	3	301.00
	2/0 AWG-300 kcmil Cu	1.3	2	CVC400LA3	2	271.00
LA, LH, Q4	250-500 kcmil Cu	2.3	1	CVC400LA5	1	118.00
	250-500 kcmil Cu	3.20	2	CVC600LI5	2	491.00
ME4, MX4	250-500 kcmil Cu	2.6	1	CVC400ME5	1	295.00
ME, MX	250-500 kcmil Cu	2.4	2	CVC600MA5	2	425.00
NA, NC, NE, NX	250-500 kcmil Cu	3.3	4	CVC1200NE5	4	944.00
	500-750 kcmil Cu	3.6	4	CVC1200NE7	4	944.00

- ▲ See instruction bulletins for recommended tools.
- These lug kits cannot be used on I-Line® circuit breakers.
- ♦ Unless otherwise specified, wire sizes apply to both aluminum and copper conductors.
- ★ All P-frame circuit breakers require terminal pads for mounting lugs of any type.

Power Distribution Connectors (PDC) for Circuit Breakers—for Field Replacement of Mechanical Lugs

Can be used for multiple load connections on one circuit breaker. Use in place of standard distribution blocks to save space and time.

Field-installable kits, including tin-plated aluminum connectors and all necessary mounting hardware are available for Square D FA, KA, LA, MA, MH, ME, MX, Q4 and P-frame molded case circuit breakers.

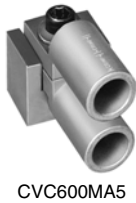
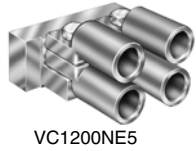
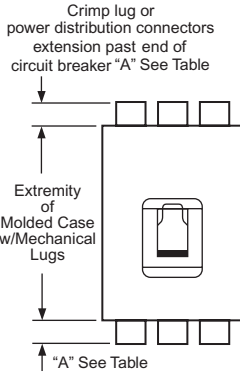
Connectors are UL Listed:

- For use on load end of circuit breaker only
- For use in UL508 Industrial Control applications only
- For use in UL 1995/CSA C22.2 No. 236 heating and cooling equipment
- For copper wire only

Table 3.77: PDC Lugs

Use With Circuit Breaker ▼	Circuit Breaker Ampere Rating	Wires Per Terminal & Wire Range△	Cat. No.	Lug Quantity Per Kit	Dimension A (I.)	\$ Price Per Kit
FAL, FHL, FCL□	15-100 A	(6) 14-6 AWG	PDC6FA6	3	1.0	92.00
		(3) 14-2 AWG	PDC3FA2	3	1.2	92.00
KAL, KHL	70-250 A	(6) 14-4 AWG	PDC6KA4	3	1.0	171.00
		(2) 14-1 AWG (1) 12-2/0 AWG	PDC3KA20	3	1.5	171.00
LAL, LHL, Q4L	125-400 A	(6) 12-2/0 AWG	PDC6LA20	1	2.25	182.00
		(12) 14-4 AWG	PDC12LA4	1	1.25	129.00
		(3) 14-2 AWG (1) 2 AWG-250 kcmil	PDC4LA250	1	2.0	129.00
MAL, MHL, MEL, MXL	125-1000 A	(6) 12-2/0 AWG Cu	PDC6MA20	1	0.0	194.00
		(12) 14-4 AWG Cu	PDC12MA4	1	0.0	129.00

- ▼ Not for use with I-Line circuit breakers.
- △ When using fine stranded wire, increased cross sectional area may cause maximum wire size to be reduced.
- OFF end only when OFF end is the load end.



3 MOLDED CASE CIRCUIT BREAKERS

**NOTE:** Listed below are the catalog numbers and the components required for testing the entire family of Micrologic trip systems. The listing includes obsolete series trip systems.

**Micrologic Series B Trip Systems**

Identified by label on front of trip unit  
(LE/LX/LXI, ME/MX, NE/NX and PE/PX circuit breaker 9/92 to present)  
(SE circuit breaker 10/92 to present)

This is the latest series of standard (LX/LXI, MX, NX and PX) and full-function (LE, ME, NE, PE and SE) Micrologic trip systems.

**Table 3.78: Universal Test Set**

Description	Cat. No.	\$ Price
Universal Test Set includes the following: 1. Self-test module (CBTMT) 2. Standard and full-function Micrologic Series B module (CBTMB) includes rating plug adapter 3. Power cord 4. Ribbon cable for making the connection from the test set to the rating plug adapter 5. Instruction manual	UTS3	14022.00
For those customers who already own the Universal Test Set and want to test the latest standard and full-function (Series B) trip systems, all that is needed is Micrologic Series B module (CBTMB). Included is the rating plug adapter and instruction manual.	CBTMB	2349.00
Replacement ribbon cable and rating plug adapter for CBTMB	CBTMBRK	627.00
Long-time and ground-fault memory reset module (Series B Electronics)	MTMB	381.00

**Micrologic Series 3 and Series A Trip Systems**

Identified by two rows of rotary switches  
(ME/MX, NE/NX and PE/PX circuit breakers 11/89 to 9/92)  
(SE circuit breakers 5/90 to 10/92)

For those customers who already own the Universal Test Set (CBTU1 or UTS3) and want to test these earlier series Micrologic trip systems, see the following chart.

**Table 3.79: Micrologic Series 3 and Series A Circuit Breaker Test Module**

Circuit Breaker Test Module	Cat. No.	\$ Price
Includes rating plug adapter and instruction manual	CBTM4A	2349.00
Replacement ribbon cable and rating plug adapter for CBTM4A	CBTM4RK	627.00

**Micrologic Series 2 Trip Systems**

Identified by only one row of rotary switches  
Micrologic Series 2 Test Modules are obsolete and no longer available.

**Table 3.80: Micrologic Series 2 Circuit Breaker Test Module**

Circuit Breaker Test Modules	Cat. No.	\$ Price
SE (5/85-5/90) includes rating plug adapter and instruction pages	CBTM1	Not Available
Replacement ribbon cable and rating plug for CBTM1	CBTM1A	Not Available
ME, PE (4/85-11/89) CBTM2 obsolete, no longer available	CBTM2	Not Available
ME, NE, PE (10/86-11/89) includes rating plug adapter and instruction manual	CBTM3	Not Available
Replacement ribbon cable and rating plug for CBTM3	CBTM3A	Not Available

**Table 3.81: Micrologic Series 1 Trip Systems for Circuit Breakers Manufactured Before Micrologic**

ME/PE (8/78-4/85) Identified by slide type switches instead of rotary switches. The very first series ME and PE electronic trip circuit breakers offered by Square D.	Test Set Not Available
SE (7/83-5/85) The very first series of SE electronic trip circuit breakers had rotary switches and can be identified by a three-digit serial number.	Test Set Not Available

Note: For trip systems of this type that require testing, contact Technical Services toll free at 1-800-634-2003.



3 MOLDED CASE CIRCUIT BREAKERS



Combination Local Current Meter and Trip Indicator

**Table 3.82: Neutral Current Transformers**

Cat. No.	\$ Price	Sensor	Where Used
LE25CT2	588.00	250 A	LXL, LEL, LXIL
LE4CT2	588.00	400 A	
LE6CT2	588.00	600 A	
ME25CT2	588.00	250 A	MXL, MEL
ME4CT2	588.00	400 A	
ME8CT2	588.00	800 A	
NE12CT2	588.00	1200 A	NXL, NEL
PE12CT2	588.00	1200 A	PXF, PEF
PE16CT2	588.00	1600 A	
PE20CT2	588.00	2000 A	
PE25CT2	588.00	2500 A	

**Table 3.83: Electronic Trip Indicator and Current Meter Field-installable Kits**

Device	Cat. No.	Included With Circuit Breaker	Optional	\$ Price
Local Trip Indicator Kit	ALTI	—	LXL, LXIL, MXL, NXL	1461.00
Local Current Meter Kit/Trip Indicator	ALAM	LEL, MEL, NEL, SE	LXL, LXIL, MXL, NXL	2286.00
Local Trip Indicator Kit	ALTIP	—	PXF	1461.00
Local Current Meter Kit/Trip Indicator	ALAMP	PEF	PXF	2286.00

**Table 3.84: Interchangeable Rating Plug Kits for all Circuit Breakers with Micrologic Series B Trip System**

Cat. No.	Sensor Multiplier Value	\$ Price
ARP040	0.400	297.00
ARP050	0.500	297.00
ARP056	0.563	297.00
ARP058	0.583	297.00
ARP060	0.600	297.00
ARP063	0.625	297.00
ARP067	0.667	297.00
ARP070	0.700	297.00
ARP075	0.750	297.00
ARP080	0.800	297.00
ARP083	0.833	297.00
ARP088	0.875	297.00
ARP090	0.900	297.00
ARP100	1.000	297.00

**Complying with NEC®**

The National Electrical Code, Section 240-6(c) exception allows conductor ampere ratings equal to the selected long-time pick-up setting. Square D offers the seals below to restrict access to trip unit once settings are selected.

**Table 3.85: Trip Unit Seals**

Description	Cat. No.	Package Quantity	\$ Price
Trip Unit Seal	TUSEAL	100	102.00

**Table 3.86: Communication Adapter**

Description	Cat. No.	\$ Price
Communication Adapter	CIM3F▲	465.00

▲ Required for Micrologic to communicate with PowerLogic® system.



Electronic Trip Unit with Seals Installed to Restrict Access



CIM3F Communication Adapter

**RIM32 Restraint Interface Module**

**Table 3.87: ZSI Combinations**

ZSI Combinations (Where All Inputs Driven Are Same Column)								
Circuit Breaker Series	Inputs							
	SE 2 (Ground Fault)	SE 2 (Short Time)	ME 3, NE1, PE 4	ME 4 & 5, NE 2 & 3 PE 5 & 6, SE 3	ME 5A, NE 3A, PE 6A, SE 3A	LE 1B, ME 5B, NE 3B, PE 6B, SE 3B	GC100	RIM 32
SE 2 (Ground Fault)	50		R	R	R	R	R	50
SE 2 (Short Time)		1	R	R	R	R	R	50
ME 3, NE1, PE 4	50	R	15	2	13	47	R	50
ME 4, 5 & 5A, NE 2, 3 & 3A, PE 5, 6 & 6A, SE 3, 3A	50	R	R	1	1	7	R	14
LE 1B, ME 5B, NE 3B, PE 6B, SE 3B	50	R	10	1	R	26	R	44
GC 100	R	R	R	R	R	R	7	50
GFM▲	50		2	1	1	5	R	10
RIM32	50	6	50	7	37	50	15	50

▲ GFM is an output device only.

- # Maximum inputs without RIM32. Self-restraint counts as one input.
- R RIM32(s) required to restrain any devices.
- Present design.
- Invalid combination.

The RIM32 Restraint Interface Module is used to interface the restraint signals between various Square D Micrologic® circuit breakers, Micrologic ground-fault modules, and GC-100 ground-fault protection systems.

The restraint interface module operates on either 120 or 240 Vac, 50/60 Hz. The module is protected by a 1/4 A fuse.

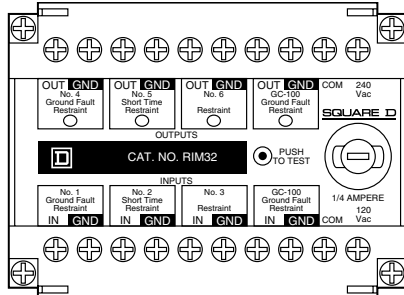
Allowable ZSI combinations are shown in Table 3.87. (Series numbers for current design circuit breakers end in B, for example NE Series 3B.) For double-ended or larger systems, or systems which contain devices from different columns in Table 3.87, contact your local Sales Office for combination information.

If more inputs or outputs are needed, another restraint interface module is necessary. Contact your local Sales Office for information on multiple module installations.

**NOTE:** The maximum distance between devices is 1000 ft. (305 m).

**Table 3.88: RIM32**

Cat. No.	\$ Price
RIM32	2768.00



**S48890 and S48895 Restraint Interface Modules**

**Table 3.89: RIM Requirements**

	Micrologic #.0x Trip Units	Square D Micrologic Series B Trip Units	Square D GC-100 Ground-Fault Relay for Equipment Protection	Square DGC-200 Ground-Fault Relay for Equipment Protection	Merlin Gerin STR58 Trip Units	Federal Pioneer USRC and USRCM Trip Units
Micrologic #.0x Trip Units	15	R	R	15	15	R
Square D Micrologic Series B Trip Units	R	26	R	R	R	15
Square D GC-100 Ground-Fault Relay for Equipment Protection	R	R	7	R	R	R
Square D GC-200 Ground-Fault Relay for Equipment Protection	15	R	R	15	15	R
Merlin Gerin STR58 Trip Units	15	R	R	15	15	R
Merlin Gerin STR53 Trip Units	15	R	R	15	15	R
Federal Pioneer USRC and USRCM Trip Units	R	15	R	R	R	15
Square D Add-on Ground-Fault Module for Equipment Protection	R	5	R	R	R	R

Note: R=RIM module is required to restrain any devices. Numerical References=Maximum number of upstream circuit breakers which can be restrained without requiring a RIM module.

The Restraint Interface Module (RIM) is used to allow zone-selective Interlocking communications between circuit breakers with Micrologic® Series B trip units or Micrologic® #.0x trip units, Compact® STR53 trip units, Masterpact® STR58 trip units, Federal Pioneer USRC and USRCM trip units, and Square D GC series ground-fault relays.

Upstream circuit breakers with Micrologic 3.0A, 5.0A 5.0P, 5.0H, 6.0A, 6.0P, and 6.0H trip units can receive up to 15 input signals without requiring a restraint interface module. If the number of input signals exceeds 15, then a RIM is required. Contact your local Sales Office for RIM requirements.

The restraint interface module operates on either 120 Vac/24 Vdc, or 240 Vac/24 Vdc, 50/50 Hz.

**NOTE:** The maximum distance between devices is 1000 ft. (305 m)

**Table 3.90: Restraint Interface Module (RIM)**

Cat. No.	Voltage	\$ Price
S48890	120 Vac/24 Vdc	1860.00
S48895	240 Vac/24 Vdc	1860.00

**3 MOLDED CASE CIRCUIT BREAKERS**



GFM250

**Micrologic® Add-On Ground-Fault Module (GFM)**

The Micrologic ground-fault module (GFM) is a UL Listed circuit breaker accessory for equipment protection. It is a combination ground-fault relay and ground-fault sensing device.

**Micrologic Add-On Ground-Fault Module Features:**

- Used in combination with the FA, KA, FC, KC, FI, and KI type circuit breakers with a ground-fault shunt trip factory installed (add the suffix "G" to the circuit breaker)
- Adjustable ground-fault pickup levels
- Adjustable ground-fault time delays
- Integral ground fault push-to-test feature and ground-fault indicator
- All GFMs supplied for I-Line® mounting, easily convertible to unit mount by removing the I-Line brackets
- Neutral current transformer is supplied for 3-phase 4-wire applications. Refer to instructions for proper installation
- Zone-selective interlocking capability is standard with upstream Micrologic trip system circuit breakers. The GFM can also be zone interlocked with the GC ground-fault system by using a restraint interface module. See Supplementary Digest
- 120 Vac control power is required for integral test feature. Meets NEC 230-95(c)

**NOTE:** Ground-fault modules cannot be reverse fed.

**Table 3.91: Module/Enclosure Selection Chart**

Companion Circuit Breaker Prefix	Cat. No.	Enclosure Space Required		Ground-Fault Pickup Adjustment Range	GFM \$ Price
		I-Line Switchboard	Individual Enclosure ▲		
FAL, FHL, FCL, FA, FH, FC	GFM100FA	LA	KA	20–100 A	4250.00
FI	GFM100FI	LA	—	20–100 A	4250.00
KAL, KHL, KI, KA, KH, KC	GFM250	LA	LA	40–200 A	4250.00
FIL	GFM100FI	—	Factory installed only. See Digest page 7-55.	20–100 A	4250.00
KCL, KIL	GFM250	—	—	40–200 A	4250.00

▲ Use NEMA 1 or 3R enclosures only. See page 3-35 for dimensions.

**Ground-Censor® Type GA—600 Vac**

The Type GA Ground-Censor equipment ground-fault protection system is recommended for protection of motor branch circuits. The type GA system is not recommended for service entrance applications, see GC200 in Section 7 of the Digest. The GA system requires the following components: GA relay, GA sensor, and circuit interrupter with 120 Vac shunt trip. GA test panel is optional, however sensor selected must be compatible with test panel when one is used▲.

Consider substituting GC-200 or Vigirex® ground-fault relays.

**Type GA System Features:**

- Ground-fault current pickup adjustable from 4–1200 A, dependent on the sensor used and the connections
- Time delay field adjustable from instantaneous to 36 cycles
- Test panel available to meet NEC 230-95. Test with or without tripping. Requires 120 Vac 50/60 Hz power (50 VA min.)
- 120 Vac shunt trip is required on the circuit breaker to interrupt the circuit
- Relay contacts are rated for 10 A continuous @ 250 Vac UL Listed

**Table 3.92: GA Catalog Numbers**

Description	Ground-Fault Trip Range	Cat. No.	\$ Price
Instantaneous relay	Dependent on sensor and connections	GA12	990.00
Time delay relay (for motor starter applications)		GAT12	1428.00
Sensor Type GA■	Window Size 3-3/4 in. Dia.	GA375T	671.00
	3-3/4 in. Dia.	GA375▲	611.00
	2-1/2 in. Dia.	GA250▲	566.00
	7-7/8 in. x 11-1/4 in.	GA811	1211.00
	7-7/8 in. x 15-3/4 in.	GA816	1376.00
7-7/8 in. x 24-5/8 in.	GA825	1665.00	
Test Panel	Same As Sensor	GA12TPM	1589.00

▲ Does not have connections for test panel.

■ Requires 2 inch clearance from current carrying wires on all sides.



GA12



GA375

3 MOLDED CASE CIRCUIT BREAKERS



## Circuit Breaker Dimensions

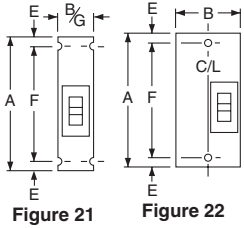


Figure 21 Figure 22

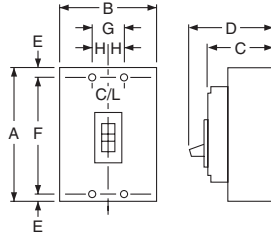


Figure 23

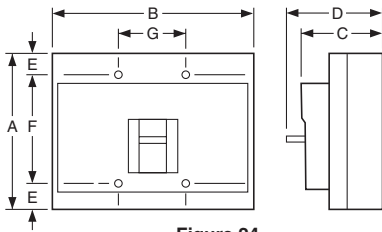


Figure 24

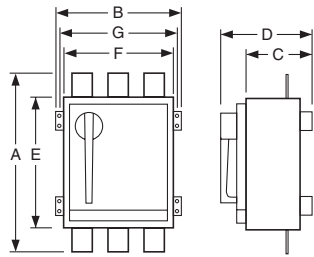


Figure 25

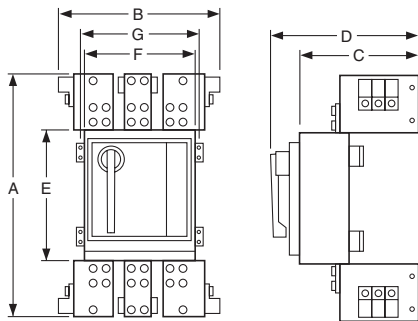


Figure 26

Table 3.93: Circuit Breakers Dimensions

Circuit Breaker Catalog No. Prefix	No. Poles	Fig. No.	Dimensions—Inches							
			A	B	C	D	E	F	G	H
FCL	1	21	6.00	1.50	3.16	4.13	0.44	5.13	1.50	—
	2	22	6.00	3.00▲	3.16	4.13	0.44	5.13	—	—
	3	23	6.00	4.50	3.16	4.13	0.44	5.13	1.50	0.75
FAL, FHL	1	21	6.00	1.50	3.16	4.13	0.44	5.13	1.50	—
	2	22	6.00	3.00	3.16	4.13	0.44	5.13	—	—
	3	23	6.00	4.50	3.16	4.13	0.44	5.13	1.50	0.75
FIL, KAL, KHL, KIL	2 & 3	23	8.00	4.50	3.66	4.75	0.44	7.13	1.50	0.75
KCL	2 & 3	23	8.00	4.50	3.66	4.75	0.44	7.13	1.50	0.75
LC, LI, LE, LX, LXI	2 & 3	23	11.86	7.50	5.48	6.74	0.55	10.75	2.50	—
Q4L, LAL, LHL	2 & 3	23	11.00	6.00	4.06	5.84	0.88	9.25	2.00	1.00
MAL, MHL	2 & 3	23	14.00	9.00	4.53	6.50	1.66	10.69	3.00	1.50
NA, NC, NX, NE	2 & 3	24	12.12	14.98	6.40	8.07	1.69	8.75	5.0	—
PA, PH, PX, PE	2 & 3	25	20.06	13.70	7.25	10.47	14.00	12.00	12.75	—
PC, PX-25, PE-20-25	2 & 3	26	26.10	23.30	13.33	16.55	14.10	12.00	—	—

▲ FCL 2-pole circuit breaker dimension B is 4.50 as in Fig. 23.

Table 3.94:

Frame Size	Approx. Shipping Weight (Lbs.)	Frame Size	Approx. Shipping Weight (Lbs.)
FAL	3	LAL	15
FHL 2-pole		LHL	
FCL	5	LXL	25
FAL 3-pole		LEL	
FHL 3-pole		LCL	
FCL		LIL	
FIL	8	MAL	34
KAL	7	MHL	
KHL		9	PAF
KCL	PHF		
KIL	15	PXF	80
Q4L		PEF	

Circuit breaker enclosures are UL Listed, CSA Certified and are suitable for use as service equipment except as footnoted.

- The short circuit rating of an enclosed circuit breaker is equal to the rating of the circuit breaker installed, except as footnoted.
- Circuit breakers are ordered and shipped separately for field installation.
- For enclosure accessories refer to page 3-38 . For enclosure dimensions refer to page 3-37.



FA100X



FA100Y

**Table 3.95: Circuit Breaker Enclosures**

Circuit Breaker			Enclosure						
Cat. No.	Prefix	Rating	Poles	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
			NEMA 1 Flush		NEMA 1 Surface		NEMA 3R▲		
LAL, LHL, Q4L, KAL, KHL		125–400 A	2, 3	LA400F	356.00	LA400S	356.00	LA400R	1655.00
			NEMA 4, 4X, 5, 3, 3R Stainless Steel (Hubs—See page 3-9)		NEMA 12/3R, 12K (Hubs—See page 3-9)				
					With Knockouts (NEMA 12K)		Without Knockouts★ (NEMA 12/3R, 5)		
KAL, KIL▼, KCL, KHL		110–250 A	2, 3	IK250DS	5238.00	—	—	IK250AWK	878.00
			NEMA 7♦ Cast Aluminum		NEMA 9△ Cast Aluminum				
FAL□		15–60 A	1, 2, 3	FA060X◇	1620.00	FA060Y■	1227.00		
		15–100 A	1, 2, 3	FA100X◇	2006.00	FA100Y■	1389.00		
KAL□		70–225 A	2, 3	KA225X★■◇	4083.00	KA225Y■★	2834.00		

- ▲ Enclosures with NRB or RB suffix have provisions for 3/4 in. through 2-1/2 in. bolt-on hubs in top endwall. Enclosures with R suffix have blank endwalls and require field cut opening. For details and hub catalog numbers see Digest Section 3.
- Not CSA Certified.
- ♦ NEMA 7—Indoor Hazardous Locations—Division 1 and 2, Class I, Groups C and D; Class II, Groups E, F and G; Class III.
- ★ Suitable for rainproof NEMA 3R application by removing drain screw from bottom endwall.
- ▼ Short circuit rating is 100 k AIR at 480 Vac maximum.
- △ NEMA 9—Indoor Hazardous Locations—Division 1 and 2, Class II, Groups E, F and G; Class III
- Use 75°C Copper conductors only.
- ◇ Suitable for rainproof applications—includes PKDB1 breather and drain kit.
- ★ Not UL Listed due to wire bending space requirements.

**Enclosed Motor-Operated Molded Case Circuit Breakers**

**NOTE:** Contact local Field Office for catalog number prior to quoting or placing an order.

Motor-operated enclosed circuit breakers are utilized whenever it is desired to control the operation of an individually mounted circuit breaker from a remote location. Enclosed motor operated circuit breakers are available in either NEMA 1 or 3R construction. 120 Vac control circuit required for operation of motor operator. Sufficient space is included for field-installation of a terminal block for convenient end-user control circuit wiring. Not UL Listed.

Enclosed motor-operated circuit breaker with neutral

- Specify circuit breaker catalog number (ex: FAL36060)
- Specify side mounted operator only.
- Specify enclosure type (ex: NEMA 1, 3R, 12)
- Specify if neutrals are required (Same price)

**Table 3.96: Enclosed Motor-Operated Circuit Breakers**

Circuit Breaker Type	\$ Price ▲	
	NEMA 1	NEMA 3R
FAL—240 V	2915.00	3149.00
FAL—480 V	3131.00	3369.00
FAL—600 V	3308.00	3525.00
FHL—600 V	3725.00	3950.00
KAL—600 V	7050.00	7277.00
KHL—600 V	10152.00	10377.00
LAL—600 V	11187.00	11477.00
LHL—600 V	14147.00	14429.00
MAL—600 A—600 V	14093.00	14375.00
MAL—800 A—600 V	16467.00	16766.00
MAL—1000 A—600 V	18641.00	19065.00
MHL—600 A—600 V	15948.00	16248.00
MHL—800 A—600 V	18360.00	18639.00
MHL—1000 A—600 V	20507.00	20811.00

▲ Price includes 3P circuit breaker, motor operator, and neutral assembly factory assembled in specified enclosure.

**Enclosed Molded Case Switches**

Enclosed molded case switches are UL Listed devices supplied with factory-installed automatic molded case switch. Use the Cat. No. listed below and add the enclosure style suffix. An insulated groundable neutral, if required, must be ordered separately from page 7-58. Enclosed molded case switches are manufactured on order only.

**Table 3.97: Enclosed Molded Case Switches**

System	Ampere Rating	Cat. No. Add Suffix	600 Vac Short Circuit Withstand Ratings	\$ Price			
				NEMA 1	NEMA 3R▲	NEMA 4,4X,5	NEMA 12
				(F) or (S)	(RB) or (R)	(DS)	(AWK)
<b>FH—100 A Frame, 3P, 600 Vac Max.</b>							
2P	100	FHE26000()	18 kA	963.00	1277.00	2273.00	1083.00
3P	100	FHE36000()	18 kA	1187.00	1499.00	2432.00	1310.00
<b>KH—225 A Frame, 3P, 600 Vac Max.</b>							
2P	225	KHE26000()	25 kA	2064.00	2556.00	4770.00	2339.00
3P	225	KHE36000()	25 kA	2523.00	3015.00	5228.00	2799.00
<b>LH—400 A Frame, 3P, 600 Vac Max.</b>							
2P	400	LHE26000()	25 kA	3915.00	5174.00	9264.00	4497.00
3P	400	LHE36000()	25 kA	4653.00	5982.00	9999.00	5232.00
<b>MH—600 A Frame, 3P, 600 Vac Max.</b>							
2P	600	MHE260006()	25 kA	5919.00	7496.00	15462.00	6990.00
3P	600	MHE360006()	25 kA	7161.00	8739.00	16706.00	8235.00
<b>MH—800 A Frame, 3P, 600 Vac Max.</b>							
2P	800	MHE260008()	25 kA	6572.00	8150.00	16118.00	7212.00
3P	800	MHE360008()	25 kA	7814.00	9393.00	17361.00	8891.00
<b>MH—1000 A Frame, 3P, 600 Vac Max.</b>							
2P	1000	MHE26000()	25 kA	7814.00	9393.00	17361.00	8891.00
3P	1000	MHE36000()	25 kA	9866.00	11442.00	19412.00	10940.00
<b>NC—1200 A Frame, 3P, 600 Vac Max.</b>							
2P	1200	NCE2600012()	65 kA	—	—	—	12123.00
3P	1200	NCE3600012()	65 kA	—	—	—	13601.00

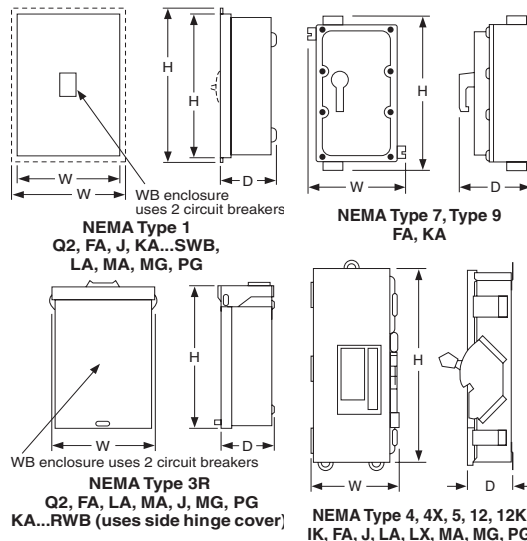
▲ FHE and KHE devices accept bolt-on hubs and have a suffix RB. LHE, MHE and NCE devices have blank endwalls and have a suffix R. For details and hub catalog numbers see page 3-9.

Dimensions: Refer to enclosed circuit breaker dimensions by NEMA type on page 7-58.

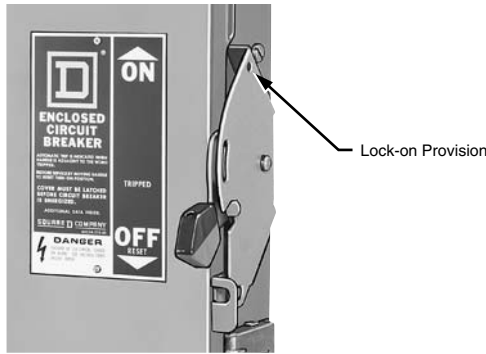
**Table 3.98: Enclosure Dimensions**

Cat. No.	Series	Approximate Dimension					
		H		W		D	
		in.	mm	in.	mm	in.	mm
FA060X■	E1	16.00	406	9.88	251	7.00	178
FA060Y■	E1	16.00	406	9.88	251	7.00	178
FA100X■	E1	16.00	406	9.88	251	7.00	178
FA100Y■	E1	16.00	406	9.88	251	7.00	178
IK250AWK	E2	42.25	1073	13.88	353	7.50	191
IK250DS	E2	42.25	1073	13.88	353	7.50	191
KA225X■	C2	22.63	575	10.88	276	7.75	197
KA225Y■	A2	21.88	556	11.00	279	7.50	191
LA400F	E2	45.63	1159	16.50	419	6.50	165
LA400R	E2	44.00	1118	15.38	391	7.88	200
LA400S	E2	44.50	1130	15.38	391	6.50	165

■ Tapped conduit opening, top and bottom endwall: FA060X/Y-3/ 4", FA100X/Y-1-1/ 4", KA225X/Y-2-1/ 2".



**Lock-On Provisions**



Lock-off provisions are standard on all NEMA Type 4-4X-5 stainless steel and NEMA Type 12, 12K circuit breaker enclosures. Provision for one inch hasp padlock is available factory installed. This modification will allow the circuit breaker to be locked in the ON position. When locked in the ON position, the external operator will not indicate if circuit breaker is tripped. UL Listed.

**Table 3.99: Price Adder Each Enclosure**

Enclosure Prefix	Suffix for Lock-On Provision	\$ Price
FA, KA, J	SPLO	155.00
LA, MA, M, P		234.00

**Pilot Light—Selector Switch—Push Button**

Pilot lights, push buttons or selector switches are available factory installed in the cover of NEMA Type 3R, (4-4X-5) stainless steel or 12 enclosures. Wiring to contact blocks is not available. Customer must furnish catalog number of device desired. Price = circuit breaker + enclosure + neutral + ground + pilot light, push button and/or selector switch + factory-installed adder. Order by description. Not UL Listed.

**Table 3.100: Price Adder**

Quantity	\$ Price Adder
For Each Device Installed	297.00

**Phenolic Legend Plate**

Available engraved and mounted on most circuit breaker enclosures. Legend engraved in 1/4 4-inch high white letters on black background. Customer must provide legend. UL Listed. Not available on NEMA Type 7 or 9 enclosures.

To order, add suffix NP to standard catalog number (i.e. LA400SNP). Price adder per legend plate: **\$167.00**

**Table 3.104: Insulated Groundable Neutral Assembly**

Circuit Breaker		Neutral Assembly For Use With						Terminal Lug Data—Total Available (Line plus Load) AWG/kcmil
Cat. No. Prefix	Ampere Rating	NEMA 1 & 3R		NEMA 4, 4X, 5, 12 & 12K		NEMA 7 & 9		
		Cat. No.	\$ Price	Cat. No.	Price	Cat. No.	\$ Price	
KAL, KHL	225	SN225KA	201.00	—	—	—	—	(2) 4–300 Al/Cu, plus (2) 14–1/0 Al/Cu
KAL, KHL, KIL, KCL	225	—	—	SN225KA	201.00	—	—	(2) 4–300 Al/Cu, plus (2) 14–1/0 Al/Cu
KAL, KHL	225	—	—	—	—	225SNA	198.00	(4) 6–300 Cu
KAL, KHL, KIL, KCL	250	—	—	SN400LA	251.00	—	—	(2) 1–600 or (4) 1–250 Al/Cu, plus (2) 4–300 Al/Cu
KAL...WB	200	Requires (2) SN20A plus (1) SN20NI link	(2) @ \$266.00 ea plus (1) @ \$36.80 ea	—	—	—	—	(4) 6–250 Al/Cu, plus (2) 14–1/0 Al/Cu
KAL...WB	225, 250	Requires (1) SN400LA	251.00	—	—	—	—	(2) 1–600 or (4) 1–250 Al/Cu, plus (2) 4–300 Al/Cu

♦ For applications above 200 A requiring a neutral, use copper wire only.

**Equipment Ground Kit**

Price adder includes price of ground bar kit.

**Table 3.105: Ground Kit Price Adder**

Enclosure		Number of Terminals per Kit	Conductors Per Terminal	Wire Range AWG/kcmil	Field-Installable		Factory-Installed*	
Enclosure Type	Circuit Breaker Cat. No. Prefix				Ground Bar Kit Cat. No.	\$ Price	Suffix	\$ Price
NEMA Type 1 and 3R	FAL, FHL, FCL, FIL KAL, KHL, KCL, KIL LAL, LHL	2	1	10–2/0 Cu or 6–2/0 Al	PKOGTA2Δ	263.00	GL	191.00
NEMA Type 4-4X-5 stainless steel and NEMA Type 12	FAL, FHL, FCL, FIL KAL, KHL, KCL, KIL LAL, LHL, Q4L							
	M, P▼	2	1	10–2/0 Cu or 6–2/0 Al		263.00		263.00

\* For factory installation of equipment ground lugs in these or any other enclosures, add suffix GL.

▼ Use of PKOGTA2 with M, and P enclosure prefix not UL Listed

Δ Quantity (2) may be required for some wire installation.

**Special Paint**

UL Listed circuit breaker enclosures are available painted with special safety colors. Special colors available are safety red, safety orange, safety yellow, safety green, safety blue, safety purple, black and white.

All colors comply with OSHA Standard 1910.144 and ANSI Specification Z535.1 for marking physical hazards.

A minimum quantity of ten is required. Order by description. Not available for NEMA Type 7/9 or stainless steel enclosures.

Shipment: 6 weeks

**Table 3.101: Price Adder Each Enclosure**

Enclosure Prefix				
FA \$ Price	KA, J \$ Price	LA \$ Price	MA, M \$ Price	P \$ Price
113.00	180.00	327.00	429.00	513.00

**Stainless Steel Front**

NEMA Type 1, flush-mount circuit breaker enclosures are available with stainless steel fronts. This modification is desirable in food handling areas such as cafeterias and restaurants. Not UL Listed. Minimum quantity of 10 per catalog number is required.

**Table 3.102: Price Each Enclosure**

Cat. No.	\$ Price
FA100FSS	1659.00
KA225FSS	1697.00
LA400FSS	2223.00
MA1000FSS	2475.00

**Enclosed Ground-Fault Modules (GFM)**

Ground-fault modules (GFM) can be factory installed on FAL, FHL, FCL, KAL and KHL circuit breakers and enclosed in the next larger size NEMA 1 or 3R enclosure, KA requires G suffix (ground fault shunt trip) circuit breaker.

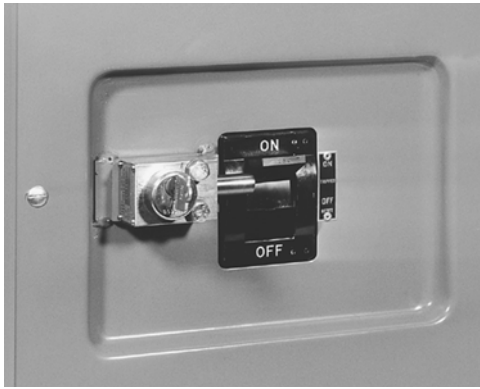
Enclosed circuit breaker with ground-fault module

- Specify circuit breaker catalog number: (ex: KAL36225G)
- Specify enclosure type (NEMA 1 or 3R)
- Ground-fault modules are available factory installed. See table below for pricing and availability.

**Table 3.103: Enclosed Circuit Breaker with Ground Fault Module**

Circuit Breaker Prefix	\$ Price ■	
	NEMA 1	NEMA 3R
FAL, 600 V, 15–60 A	6585.00	7091.00
FAL, 600 V, 70–100 A	6797.00	7307.00
KAL, 600 V	8424.00	8918.00

■ Price includes 3P circuit breaker, GFM, neutral assembly and neutral CT factory assembled in specified enclosure









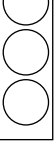
**Key Interlock Systems**

(Factory installed only)

Interlocks are used to prevent the authorized operator from making an unauthorized operation. Not available on hazardous location devices (NEMA 7/9.)

The key interlock system is a simple and easy method of applying individual key interlock units and assemblies to the above equipment so as to require operation in a predetermined sequence. UL Listed.

**Table 3.106: Locking Position Designations**

Locking Position	Designation
	Device locked open with key removed.
	Device locked closed with key removed.
	Device locked open or closed with key removed.
	Device locked open with key held.
	Device locked closed with key held.
	Device locked open or closed with key held.
	Multi-lock interlock. (More than one key per lock.)

**NOTE:** 1. Device locked open (circuit breaker in OFF position).  
2. Device locked closed (circuit breaker in ON position).

**Quoting:**

Contact local Field Sales office for catalog number, availability and pricing prior to quoting a job.

**Ordering:**

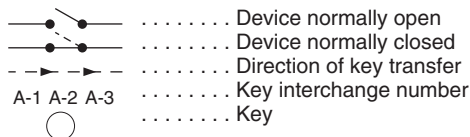
- Order cannot be released for production until the following information has been provided.
- End User—Company name, address
- Function of each lock (e.g., circuit breaker to be locked open with key removed, key held when circuit breaker is closed)
- Existing Equipment—if circuit breaker is to be interlocked with equipment already on site, provide brand of existing lock and key number
- Other New Equipment—if circuit breaker is to be interlocked with new equipment not yet installed at the site, then provide contact person and phone number so that locks may be coordinated
- Additional information may be required upon order entry
- Federal Pioneer locks supplied unless otherwise specified

**Table 3.107: Price Adder Per Lock, Each Complete Enclosed Device▲**

Device	\$ Price
Enclosed industrial circuit breaker	2055.00

▲ Prices do not apply when more than three devices are interlocked as these schemes normally require more than one key assembly per device.

**Diagram Symbols**



**Sample Application—1**

To prevent two devices from being closed simultaneously.

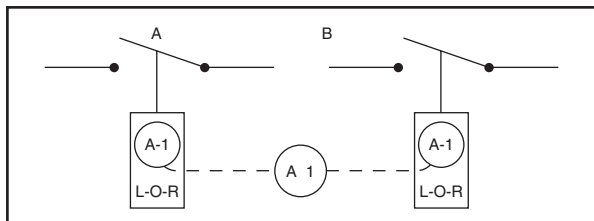


Figure 1

Two devices are shown in Figure 1. In operation they are not closed at the same time. With the interlocks arranged as shown only one key is required in the interlocking system. Both devices are shown open, therefore, the key is free. To close any one device the key is inserted and turned in that particular lock, the key is held in this lock until the device is again locked open. This simple interlocking sequence lends itself to a multitude of applications. The procedure is the same for two devices, neither of which is to be opened at the same time.

**Sample Application—2**

To prevent opening of switch A when circuit breaker B is closed.

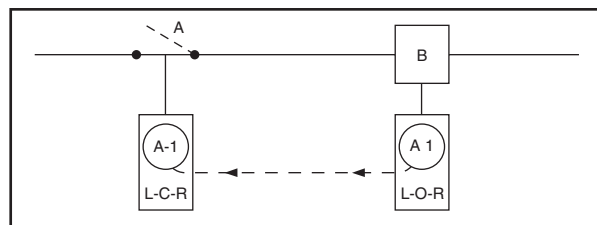


Figure 2

Switch A and circuit breaker B are in closed position. Key A-1 is held in circuit breaker B interlock.

1. Open circuit breaker.
2. Turn key A-1 in L-O-R interlock on circuit breaker B to lock open. Key A-1 is now free.
3. Insert key A-1 in L-C-R interlock on switch A and turn to unlock.
4. Open switch A. Key A-1 is now held. Reverse sequence to restore service.

**Sample Application—3**

To prevent operation of switch A when circuit breaker B is closed. Permits reclosing of circuit breaker for servicing when switch is locked open.

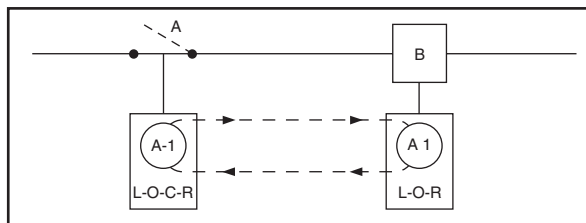


Figure 3

Switch A and circuit breaker B are in closed position. Key A-1 is held in circuit breaker interlock.

1. Open circuit breaker.
2. Turn key A-1 in L-O-R interlock on circuit breaker B to lock open. Key A-1 is now free.
3. Insert key A-1 in L-O-C-R interlock on switch A and turn to unlock.
4. Open switch A.
5. Turn key A-1 in L-O-C-R interlock on switch A to lock open. Key A-1 is now free.
6. Return key A-1 to circuit breaker interlock and unlock for operation during servicing period.

Reverse sequence to restore service.

**Sample Application—4 (Main-Tie-Main)**

To prevent paralleling of lines A and B.—Two loads, fed from either source.

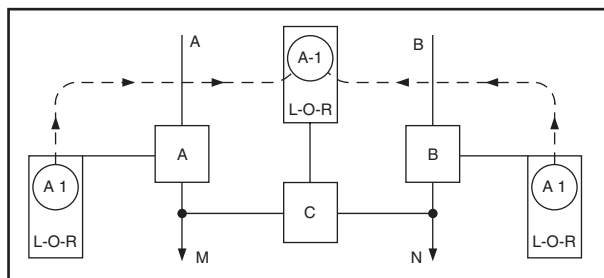


Figure 4

Circuit breaker A is closed to supply load M. Circuit breaker B is closed to supply load N. Tie-circuit breaker C is open. Keys A-1 are held in interlocks on both circuit breakers A and B. Tie-circuit breaker C cannot be closed unless either A or B is locked open.

To transfer load N to circuit breaker A, proceed as follows:

1. Open circuit breaker B.
2. Turn key A-1 in L-O-R interlock on circuit breaker B to lock open. Key A-1 is now free.
3. Insert Key A-1 in L-O-R interlock on tie-circuit breaker C and turn to unlock. Key A-1 is now held.
4. Close tie-circuit breaker C.

Reverse sequence to restore service.

Load M can be supplied through circuit breaker B in a similar manner.



NQ Panelboard with Door-in-Door (Hinged) Trim



MH38 Enclosure with 12-inch Wireway and Mono-Flat® Trim with 12-inch Wireway Cover

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by Schneider Electric

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### General Instructions

The special feature options covered in this Panelboard estimating procedure are applicable to factory-assembled panelboards only. Do not apply this pricing to ready-to-assemble panelboards.

Special features are listed in three major categories:

- Mains
- Branches
- Cabinets

### Pricing Instructions

All special feature entry prices are list prices.

Price the panelboard in the standard manner, then add for any special features required to obtain the total price.

Certain features already appear in the Q2C or EQM panelboard quotation system. For those features not listed in the quotation system, enter the information as it appears in this publication with the appropriate price in the "Other Special Features" screen in Q2C or EQM. Follow the example below:

Quantity	Description	\$ Price
1	Corbin Locks	704.00

### Metric Conversion

Inches (in.) x 25.4 = millimeters (mm).

If you have any questions, contact your nearest Schneider Electric sales office.





**Metering—Type 1 Enclosures Only (1200 A Maximum)**

Refer to SW-2A publication, *Low Voltage Switchboards and Panelboards with PowerLogic® Power Monitoring and Control Supplementary Pricing*, for additional selection and pricing information. Include current transformers or potential transformers as required. Enclosures and Interiors are shipped fully assembled.

NQ, NF and Powerlink® require a 7-inch left side gutter extension and a 6-inch main end extension for PowerLogic Power Meter applications. Refer to SW-2A for prices and dimensional information.

7-inch side gutter extension, add ..... **\$960.00**  
6-inch main end extension, add ..... **428.00**

**NOTE:** *I-Line® and QMB require a 14-inch side gutter extension for PowerLogic Circuit Monitor and Power Meter applications. Refer to SW-2A for side gutter prices.*



**Current Transformers In Mains (ac only and line side only)▲**

Prices listed are based on transformers having a 5 A secondary and mounted under a separate cover. Apply appropriate charge from the table below

**Table 4.1: Current Transformers**

Primary Amperes (5 A—Secondary)	\$ Price Per C/T	Additional Enclosure Height Required ■
100–1200	<b>1804.00</b>	6 inches

**Customer Equipment Space▲**

**NOTE:** *End user must specify end use equipment to be installed.*

Available with NQ, and NF lighting panelboards only. Must be opposite the mains end, both main breaker and main lug, to prevent interference with incoming cables. Customer equipment space is not available with thru-feed lugs or sub-feed breakers.

18-inch space only with separate door, add. .... **992.00**

A barrier exists between the equipment space and the panelboard compartment; a separate door is provided as standard (requires 18-inch additional enclosure height).

- ▲ Feature supported by product selectors in Q2C and EQM.
- For NQ, and NF panelboards.



NQ Panelboard  
with Customer Equipment Space  
Feature Added

### Keyed Interlocks

**NOTE:** Not available for use in NQ, NF or I-Line<sup>®</sup> HCN panelboards with door, or in Type 4 or 4X fiberglass enclosures.

Keyed mechanical interlocking of two or more circuits is available on request. Individual locks are furnished for each circuit. All locks operate by one key, which can be removed only when the circuit is locked in the desired position.

I-Line Circuit Breakers—A 3-inch filler adjacent to the circuit is necessary for mounting the interlock; contact your nearest Schneider Electric sales office for assistance with power distribution panelboards with doors. Feature not available on vertically mounted main circuit breaker.

To the standard panelboard pricing, per interlock, add . . . . . **\$1940.00**

QMB Fusible Switches—Available on 100 A singles (100 A single QMB requires 9 inches of mounting space) through 800 A switches plus LA circuit breaker adapters. Requires 3 inches of branch mounting space per switch for interlock installation.

Per interlock, add . . . . . **1940.00**

### Motor Operators—I-Line Circuit Breakers Only

Motor operators provide remote *open*, *close*, and *reset* control of molded case circuit breakers. Price panelboard from the latest Digest, and, for each motor operator, add per table below. In I-Line panelboards, motor operators require 4.5 inches of circuit breaker mounting space. This can be provided on I-Line main circuit breaker only when the main is branch-mounted and back-fed.

**Table 4.2: Motor Operators**

Circuit Breaker Type	Voltage	\$ Price Each
F-, H-frame▲	120, 240, 480, 600 Vac	1198.00
J-frame		2975.00
LA, LH■		3908.00
PG, PJ, PL◆		4450.00

- ▲ 240, 480 and 600 Vac includes motor operator and separate Class 9070, EO-1 control circuit transformer.
- 240, 480 and 600 Vac includes motor operator and separate Class 9070, EO-3 control circuit transformer.
- ◆ Option internal to circuit breaker, not mounted adjacent to circuit breaker.

**Increased Enclosure Depth**

**Type 1 Enclosure ▲**

For 8-inch depth (HC26 ), add ..... \$640.00  
For 12-inch depth (HC32, 42, 44—12-inch only), add. .... 640.00

▲ Feature supported by product selectors in Q2C and EQM.

**Type 3R, 5, or 12 Enclosure ▲**

For 8-inch or 12-inch depth, add. .... 690.00

**NOTE:** No other depths are available.

▲ Feature supported by product selectors in Q2C and EQM.



MH38 Enclosure with 6-inch Increased Left-side Gutter

**Increased Side Gutters (Type 1 Enclosures Only)**

**NOTE:** Available on MH enclosures (right or left) in 3, 6 and 12-inch added widths, 26-inch wide HC enclosures up to a maximum of 14 additional inches and 32-inch wide HC enclosures up to a maximum of 10 additional inches. Not available on 42-inch wide HC enclosures. No barrier will be supplied unless specified. Includes one-piece trim.

Provide extended side gutters.

Add per panelboard ..... 1508.00

**Steel Barrier in Enclosure**

Add ..... 410.00

**NOTE:** The enclosure will be extended on one side only. If extension is required on both sides, contact your nearest Schneider Electric sales office for assistance.

**Extended Top and Bottom End Gutters**

**NOTE:** Available for Type 1 enclosures only

**Type MH Enclosures**

6-inch, 12-inch, 18-inch or 24-inch extension. Includes one-piece trim.▲

Add per panelboard ..... 1214.00

▲ Feature supported by product selectors in Q2C and EQM.

**Type HCN, HCM Enclosures**

9-inch extension. Includes standard panel trim and enclosure extension cover.▲

Add per panelboard ..... 1214.00

▲ Feature supported by product selectors in Q2C and EQM.

**Type HCP, HCR-U Enclosures**

12-inch extension. Includes standard panel trim and enclosure extension cover.▲

Add per panelboard ..... 1214.00

▲ Feature supported by product selectors in Q2C and EQM.

**Type QMB Enclosures**

38-inch W x 11.5-inch D may have a 6-inch maximum increased end gutter. This is the only QMB enclosure with an increased end gutter option. Available only with a four-piece trim.

Add per panelboard ..... 1214.00

For lengths other than those listed above, refer to the Wireway section on page 4-8.

**Ground Lugs**

Furnish equipment ground bar kits as listed in the Digest. In addition, if an individual ground lug is required for a larger wire termination, choose from the aluminum lugs listed below.▲

#4–250 kcmil maximum cable size, add ..... .78.00  
300 kcmil–1000 kcmil maximum cable size, add. .... 176.00

▲ Feature supported by product selectors in Q2C and EQM.



MH38 Enclosure with 12-inch Extended Bottom End Gutter and One-Piece Trim

**Drip Hoods ▲**

For each surface-mounted-only panelboard, add . . . . . \$294.00

- ▲ Feature supported by Product Selectors in Q2C and EQM.

**Special Finishes**

**NOTE:** The standard finish of the enclosure fronts is ANSI 49. The enclosures are galvanized steel.

**ANSI 49 Enclosure ▲**

Add . . . . . 584.00

**ANSI 61 Front or Enclosure ▲**

Add . . . . . 700.00

**Front and Enclosure with Polyester Acrylic Powder Paint Finish**

Provides increased salt spray performance in coastal areas and increased resistance to UV fading.

Add . . . . . 1350.00

**Special or Custom Paint for Trim and/or Enclosure**

Add . . . . . 4400.00

- ▲ Feature supported by Product Selectors in Q2C and EQM.

**Free-standing Enclosures (welded base channels) ▲**

Supports extending out front and back, welded to bottom of enclosure

Add . . . . . 876.00

- ▲ Feature supported by Product Selectors in Q2C and EQM.

**Special Trims**

**Hinged Trim ▲**

Add . . . . . 646.00

**Hinged Trim with Outer Door Lock ▲**

Add . . . . . 846.00 ■

**NOTE:** Outer door lock, must be priced with hinged trim.  
For door-in-door trim, use hinged trim with outer door lock.

**Stainless Steel Trim Fronts ▲**

NQ 20-inch-wide flush and surface, add . . . . . 4200.00  
 NF flush and surface, add . . . . . 4200.00  
 I-Line<sup>®</sup> HCN—Standard trim with door, add . . . . . 14800.00  
 I-Line HCM—Standard trim with door, add . . . . . 14800.00  
 I-Line HCP—Standard trim with door, add . . . . . 15400.00

- ▲ Feature supported by Product Selectors in Q2C and EQM.
- \$846.00 price includes a hinged trim with an integrated outer door lock.



Hinged Trim

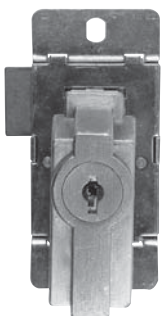


NC38S with Padlock Hasp

### Padlock Hasp

For hasp, staple and standard lock (padlock not included)

Add ..... \$600.00



Corbin 15767 Lock



NC38S with Yale Lock Installed

### Special Locks

On trim with a 3-point latch, special locks will be installed as a secondary latch. Special locks include Corbin 60, Corbin 15767, GE 75, Yale® 511S and Best 5L7RL2-626. For all other locks, contact your nearest Schneider Electric sales office for assistance.

Standard key change, Corbin 60, Corbin 15767 or GE 75, add▲ . . . 704.00  
Standard key change, Yale 511S, add▲ ..... 1700.00  
Standard key change, Best 5L7RL2-626, add▲ ..... 1500.00

### Quarter turn fasteners

Add ..... 584.00

**NOTE:** Special locks for all HC trims and NF panelboards with three-point latches, will be installed as secondary locks. Special locks are not available on I-Line® 42-inch and 44-inch wide panelboards or QMB type panelboards.

**NOTE:** Many key configurations can be accommodated with our standard Square D® brand lock. Contact your nearest Schneider Electric sales office for assistance.

▲ Feature supported by Product Selectors in Q2C and EQM.

### Multi-Section Panels

#### Equal-Height Enclosures▲

NQ, and NF, add per panel ..... 1688.00  
I-Line or QMB, add per panel ..... 2198.00



Common Trim Front for Use with Multiple-Section Panelboards Mounted Side-By-Side

#### Common Trim in Place of Two Individual Fronts▲

Used to cover two equal-height enclosures mounted side-by-side; available on MH non-hinged trims only.

Add ..... 2334.00

#### Sheared on Inside Edges

Allows enclosures to be butted together.

Add per panel ..... 1644.00

▲ Feature supported by Product Selectors in Q2C and EQM.

**Panel Skirt for Standard Width Panelboards ▲**

Panel skirts are intended for cosmetic purposes only; they are meant to hide cables which are enclosed in conduit. Do not use a panel skirt as a wireway; see the Wireway section below.

**NOTE:** Panel skirts are for Type 1 surface-mounted applications with standard depth and width, Square D® brand enclosures only.

▲ Feature supported by Product Selectors in Q2C and EQM.

**Table 4.3: Panel Skirts**

Skirt Length	\$ Price	
	NQ, NF	I-Line®, QMB
4–60 inches	912.00	1298.00
61–92 inches	1142.00	1908.00



Panel skirt framework to be bolted to the wall.



Panel skirt bolted in place below an MH26 enclosure.



Panel skirt completely installed.

**Wireway ▲**

Allows for terminating conduit in the wireway endwall. Only the cable passes through the wireway into the panelboard enclosure. Includes trim and wireway cover.

**NOTE:** Wireway is for Type 1, surface-mounted applications with standard depth and width, Square D® brand enclosures only.

▲ Feature supported by Product Selectors in Q2C and EQM.

**Table 4.4: Wireway**

Wireway Length	\$ Price	
	NQ, NF	I-Line®, QMB
4–60 inches	1014.00	1482.00
61–92 inches	1264.00	2160.00



MH38 enclosure with 12-inch wireway and Mono-Flat® trim with 12-inch wireway cover.

**Panels to Fit Existing Enclosures**

Panelboard interiors and special fronts can be furnished to fit existing enclosures. First, price the complete panel along with the appropriate price adder from below. Next, photocopy the Retrofit Existing Enclosure data sheet found on page 4-14, record the required dimensions on the photocopy and forward it with your order to the nearest Schneider Electric sales office. For interiors requiring vented enclosures, contact your nearest Schneider Electric sales office for assistance.

**NOTE:** Existing enclosure depth on flush installations must be measured from inside surface of enclosure to outer wall or plaster surface.

**Special Fronts**

Existing enclosure the same depth as or deeper than our standard.

Add..... \$1040.00

**NOTE:** Elevating brackets to be supplied by customer for existing enclosures deeper than our standard.

Existing enclosure shallower than our standard. Requires an enclosure extension (surface applications) or a formed front (flush applications). A hinged trim front option is not available for these applications.

Add..... 2080.00

**NOTE:** A formed front is available on NQ and NQOD (225 A max.) and, NF (250 A max.). When a flush front is required for an existing enclosure that is shallower than our standard, be sure to indicate the position of the enclosure with respect to the wall in which it is mounted. This is required in order to determine whether an enclosure extension with a flat front should be supplied, or whether a flush formed front is more applicable. The interior must be centered in the enclosure and, if the enclosure is deeper than our standard, the interior must be leveled within the enclosure. The existing enclosure for NQ, NQOD and, NF panels cannot be more than 1.5 inches shorter than the standard enclosure. Special trims that are manufactured to fit an existing enclosure will be within ± 0.25 inches of the specification. Refer to the table below for standard enclosure depths and for the maximum depth for which no special mounting brackets are required.

**Table 4.5: Panelboard Enclosure Depths**

Panelboard Type	Standard Enclosure Depth	Maximum Enclosure Depth for which No Special Mounting Brackets Required
NQ or NQOD standard width—main lugs only	5.75 inches	5.75 inches
NQ or NQOD standard width—main circuit breaker	5.75 inches	5.75 inches
NF	5.75 inches	5.75 inches
I-Line®—Maximum F, H or Q-frame branch circuit breaker	6.5 inches	7.25 inches
I-Line—Maximum KA or J-frame branch circuit breaker	8.25 inches	9.0 inches
I-Line—Maximum NA or R-frame branch circuit breaker	9.25 inches	10.25 inches

**Space Heater**

**NOTE:** Enclosure, interior and trim ship fully assembled. 120 V is standard. Top feed applications only.

Unwired (provisions for wiring to external source), add..... 800.00  
Wired (with overcurrent device, thermostat), add..... 1570.00

**Special Enclosures ▲**

**Type 1 Gasketed Enclosure** (gasketing between front and enclosure)

20-inch maximum panel width..... **\$494.00**  
Over 20-inch panel width..... **716.00**

**NOTE:** For 250 A and below enclosures only.

- ▲ Feature supported by Product Selectors in Q2C and EQM.



I-Line Door-in-Door Enclosure

**Stainless Steel Enclosure** (Type 3R, 4, 4X, 5 and 12; UL Listed)  
NQ, and NF

For panelboard heights up to 56 inches, add..... **17564.00**  
For panelboard heights of 59–80 inches, add..... **21076.00**

**I-Line® ▲**

HCN and HCM, add..... **36190.00**  
HCP, add..... **42482.00**

**QMB ■**

Add..... **47978.00**

- ▲ Not available for HCR-U interiors.
- Not available for QMB interiors over 800 A.



Access to Circuit Breaker Handles

**Fiberglass Enclosures** (Type 4X, Non-Vented; UL Listed)

NQ ▲, and NF ■

28-inch height, add..... **6780.00**  
33-inch, 40-inch and 50-inch height, add..... **11482.00**

**I-Line and QMB**

Add..... **Not Available**

- ▲ Not available for NQ interiors over 225 A.
- Not available for NF interiors over 250 A.



Access to Wiring Gutters

**Type 12 Door-In-Door Enclosures**

**Table 4.6: Available Enclosures**

Interior Type	Enclosure Size			\$ Price Adder
	Height	Width	Depth	
NQ	50 inches	20 inches	6.5 inches	<b>3826.00</b>
NF ▲	56 inches	20 inches	6.5 inches	<b>3826.00</b>
I-Line (HCN)	92 inches	26 inches	9.5 inches	<b>7278.00</b>
I-Line (HCM)	91 inches	32 inches	11.5 inches	<b>7854.00</b>
I-Line (HCP)	68 inches	42 inches	12.7 inches	<b>9788.00</b>
I-Line (HCP)	86 inches	42 inches	12.7 inches	<b>9788.00</b>

- ▲ Not available for NF interiors over 250 A.



**Copper Equipment Ground Bars**

Copper equivalents of our aluminum PK-GTA equipment ground bars are available. These copper ground bars accept #14-4 Cu only.



Catalog No.  
NC44SHR

**Table 4.7: Copper Ground Bars for NQOD and NF Panelboards (see the Digest, Section 9 for NQ copper ground bar kits)**

Maximum Number of Circuits	Maximum Ampere Rating	Catalog No.	\$ Price
12	225	8010302651	35.00
20	225	8010302652	41.00
25	225	8010302653	57.00
25	400/600	PK27GTACU	75.00

**Type 1 Door-in-Door (Hinged) Trim Fronts**

**Features**

- Meets door-in-door specifications
- Provides continuous piano hinge
- Permits one-person maintenance

**Table 4.9: Hinged Trim**

I-Line Fronts		NQ and NF Fronts	
Catalog No. ▲	\$ Price	Catalog No. ▲■	\$ Price
HC2652T( )HR	720.00	NC26( )HR	620.00
HC2665T( )HR	926.00	NC32( )HR	657.00
HC2674T( )HR	1254.00	NC38( )HR	687.00
HC2683T( )HR	1557.00	NC44( )HR	830.00
HC2692T( )HR	1751.00	NC50( )HR	912.00
HC3248T( )HR	846.00	NC56( )HR	983.00
HC3264T( )HR	1109.00	NC62( )HR	1109.00
HC3273T( )HR	1514.00	NC68( )HR	1185.00
HC3291T( )HR	2129.00	NC74( )HR	1215.00
HC4250T( )HR	1298.00	NC80( )HR	1245.00
HC4259T( )HR	1448.00	NC86( )HR	1430.00
HC4268T( )HR	1841.00	NC50V( )HR	912.00
HC4286T( )HR	2351.00	NC56V( )HR	983.00
HC4486T( )HR	2351.00	NC62V( )HR	1109.00
—	—	NC68V( )HR	1185.00
—	—	NC74V( )HR	1215.00
—	—	NC80V( )HR	1245.00
—	—	NC86V( )HR	1430.00

- ▲ Add "S" for surface or "F" for flush in place of the parentheses.
- For welded metal directory, add "WMD" suffix to the end of the catalog number and add \$75.00 to the price.

**Field Installable I-Line® Door Kits**

**Table 4.8: I-Line Door Kits**

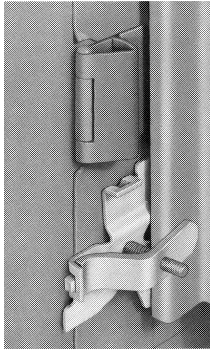
Panel Type	Catalog No. ▲	\$ Price
HCN	HCN52D( )	77.00
	HCN65D( )	90.00
	HCN74D( )	122.00
	HCN83D( )	137.00
	HCN92D( )	155.00
HCM	HCM48D( )	227.00
	HCM64D( )	254.00
	HCM73D( )	333.00
	HCM91D( )	390.00
HCP	HCW50D	323.00
	HCW59D	351.00
	HCW68D	422.00
	HCW86D	467.00
HCRU	HCW86D	467.00

- ▲ Add "S" for surface or "F" for flush in place of the parentheses.

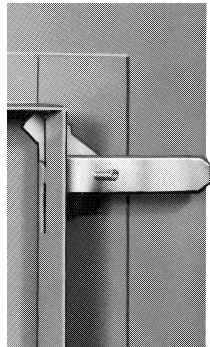
**Table 4.10: Trim Clamps and Screws**

Application	Catalog No.	\$ Price
NQO and NQOB Panelboards: All fronts	PK1TC	24.80
I-Line Panelboards: HCN: Series 1 and 2 fronts	PK2TC	24.80
NQOD Panelboards: Series E1 ▲ 400 A and 600 A fronts	LP9501	65.00
NEHB Panelboards: Series E1 ▲ 600 A fronts		
I-Line Panelboards: All Series E1 ▲ fronts	LP9502 (includes 8 trim screws and captive hardware)	81.00
NQOD Panelboards: All Series E1 ▲ vented fronts and hinged fronts manufactured after July 1994.		
NF Panelboards: All vented fronts and hinged fronts.		
NEHB Panelboards: All Series E1 ▲ hinged fronts manufactured after July 1994.	4020513001K (package of 10)	3.80
I-Line and QMB Panelboards: I-Line front with door manufactured after July 1994 but before August 1997; and I-Line hinged fronts and QMB front with door manufactured after July 1994.		
NQ and NQOD Panelboards: Screws for all fronts through 225 A.		
NF Panelboards: Screws for all fronts through 250 A.	8002506701	0.80
I-Line Panelboards: 4-piece trim and trim with door manufactured after July 1997.		
QMB Panelboards: Screws for 4-piece covers.		
I-Line Panelboards: 4-piece trim manufactured after July 1994 but before August 1997.		

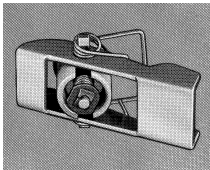
▲ Panelboards that meet 1984 NEC® Wire Bending Space are Series E1.



Catalog No.  
PK1TC



Catalog No.  
PK2TC



Catalog No.  
LP9501

**Table 4.11: Lock Attachments**

Description	Catalog No.	\$ Price
Handle lockoff/padlock attachment (for branch circuit breakers)	HPAFD	25.50

**Locks ▲**



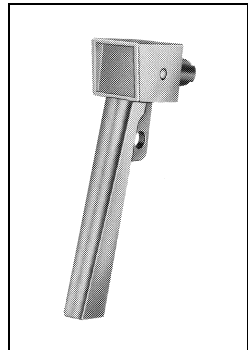
Catalog No. PK4FL



Catalog No. PK5FL



Catalog No. PK4NVL



Catalog No. 30007 11851

**Table 4.12: Locks—Type 1 Enclosures**

Application	Catalog No.	\$ Price
<b>NQ, NQOD, NQO, and NQOB Panelboards</b>		
All fronts on enclosures up to and including 50-inch high and 53-inch through 68-inch high vented trims	PK4FL (Before 01/06/97)	90.00
	PK22FL (After 01/06/97 NQ or NQOD only)	
<b>I-Line Panelboards</b>		
HCN: Series 1 and 2 fronts on enclosures up to 54 inches high	PK4FL	90.00
HCN: Series E1▲ front on enclosures up to 74 inches high		
HCM: Series 1 and 2 fronts on 38-inch high enclosures		
HCN: Series E1▲ front on 48-inch high enclosures	PK4FL (Before 11/14/97)	90.00
	PK22FL (After 11/14/97)	
<b>I-Line Panelboards (4-piece trim with door kit)</b>		
HCN: Series E1▲ fronts on enclosures up to 74 inches high	PK4FL	90.00
HCN: Series E1▲ fronts on enclosures up to 91 inches high ■	PK4FL (Before 02/22/02)	
	PK22FL (After 02/22/02)	
<b>NQ and NF Panelboards</b>		
All fronts ♦ ★ with the exception of those for use on panels using LC or LI main circuit breakers	PK22FL	90.00
<b>NQOD, NQO, and NQOB Panelboards</b>		
All fronts on enclosures 56 inches high or higher, excluding 53-inch through 68-inch high vented fronts	PK5FL (Before 11/01/99)	165.00
	PK22FL (After 11/01/99)	90.00
<b>I-Line Panelboards</b>		
HCN: Series 1 and 2 fronts on enclosures 63 inches high or higher	PK5FL	165.00
HCN: Series E1▲ fronts on enclosures 83 inches high or higher	PK5FL (Before 04/05/02)	165.00
	PK22FL (After 04/05/02)	90.00
HCM: Series 1 and 2 fronts on enclosures 47 inches high or higher	PK5FL	165.00
HCN: Series E1▲ fronts on enclosures 64 inches high or higher	PK5FL (Before 04/05/02)	165.00
	PK22FL (After 04/05/02)	90.00
HCW, HCWM, HCWM-U, HCR-U: Series E1▲	PK5FL (Before 02/23/02)	165.00
	PK22FL (After 02/23/02)	90.00
<b>I-Line Panelboards (4-piece trim with door kit)</b>		
HCN: Series E1▼ fronts on enclosures 83 inches high or higher	PK5FL (Before 02/23/02)	165.00
HCW, HCWM, HCWM-U, HCR-U: Series E1▲	PK22FL (After 02/23/02)	90.00
HCP-SU	PK22FL	90.00
<b>NQ and NF Panelboards</b>		
Fronts on enclosures 68 inches high or higher for panels using LC or LI main circuit breakers	PK5FL	165.00

- ▲ Panelboards that meet 1984 NEC® Wire Bending Space are Series E1.
- Fronts on enclosures 73 inches or higher require two locks.
- ♦ Fronts 56 inches or higher on 250 A maximum interior require two locks.
- ★ Front 74 inches or higher on 600 A maximum interior require two locks.
- ▼ One NSR-251 key is included with each lock.

**Table 4.13: Locks—Type 3R/12 Enclosures**

Application	Catalog No.	\$ Price
NQOD, NQO, NQOB, NF all enclosures Series E1	PK4NVL	167.00
NQ, NQOD, NF Series E2	8011604350 (one handle)	90.00
	8011604351 (two handles)	159.00
I-Line and QMB Series E1 ▲	PK4NVL	167.00
I-Line and QMB Series E2	8012106350	75.00
I-Line—Handle for padlocking Series 1 and 2	3000711851	Order from the Raleigh, NC plant.

- ▲ Panelboards that meet 1984 NEC® Wire Bending Space are Series E1.

**Keys**



Catalog No.  
LP9618

**Table 4.14: Replacement Keys**

Application	Catalog No.	\$ Price
For use on all locks	LP9618	28.80

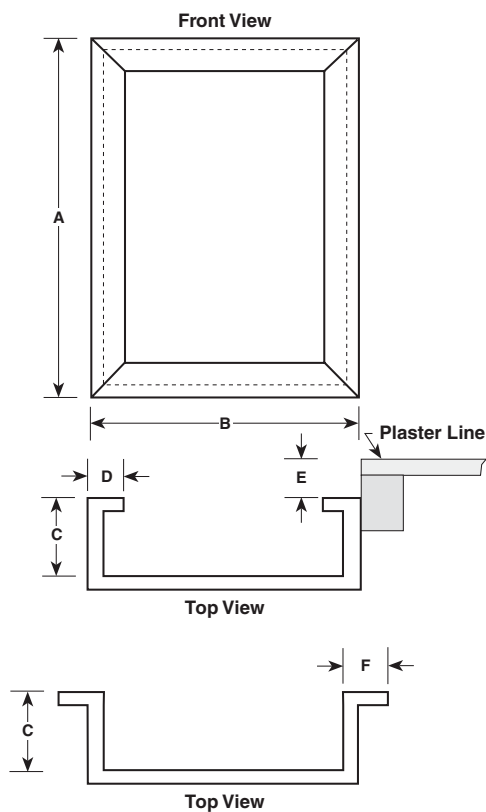
**Data Sheet for Panelboards to Retrofit Existing Enclosures**

Distributor: \_\_\_\_\_

Job Name: \_\_\_\_\_

Contractor: \_\_\_\_\_

Panel Marking: \_\_\_\_\_



The following dimensions are necessary for quotation and production of a panel to fit an existing enclosure. Provide dimensions in inches only.

**Existing Flush-Mounted Enclosures**

- Height dimension "A":
- Width dimension "B":
- Depth dimension "C":
- Flange width dimension "D":
- If enclosure is not flush with Plaster Line, dimension "E":

**Existing Surface-Mounted Enclosures**

- Height dimension "A":
- Width dimension "B":
- Depth dimension "C":
- Flange dimension may be either dimension "D" or "F"  
(select one)
  - Dimension "D":
  - Dimension "F":

**NOTE:** Trims are furnished so that the interior must be centered within the enclosure.

*If the enclosure is deeper than the standard panelboard enclosure for the required type of panelboard, customer-supplied mounting brackets may be necessary to bring the interior out to the front of the enclosure.*

*If interior requires a vented enclosure, contact your nearest Schneider Electric sales office for assistance.*

This data sheet is also available on-line.

1. Go to <http://intranet.us.schneider-electric.com>
2. Click on **U.S. Business**, then select **Sales & Marketing Home** from the pulldown menu
3. On the Sales & Marketing page, select **Support and Resources**
4. On the Support and Resources page, select **Mentor** from the **Tools** options
5. On the Mentor page, select **Mentor Order Quality** from the **Mentor Application** options
6. When the Mentor order page appears, type in a project name in the **Project Name:** field, an 8-character number in the **Q2C #** field and your name in the **Prepared by:** field. Click on the box next to **Panelboards**, and then click on the **Next-->** button at the top of the page.
7. On the Panelboards Mentor page, click on the box next to **Trims to Fit**, and then click on the **Next-->** button at the top of the page.
8. When the **File Download** window appears, click on the **Open** option.
9. When the Mentor document opens, click on the **Trims to Fit Data Sheet** link at the bottom of the page.
10. When the **File Download** window appears, click on the **Open** option to display the data sheet, or click the **Save** option to save the data sheet to your hard drive.

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**Section 5**  
**05 Switchboards**

**Power-Style® Commercial Multi-Metering Switchboards**

Meter Sockets, Covers, Hardware Kits	5-2
Tenant Main Disconnects	5-3
Class T Fusible Pullouts, CMM Pullout Heads	5-4



Power-Style® Commercial Multi-Metering  
Switchboard Lineup

### Meter Sockets, Covers, Hardware Kits

Meter socket kits include meter socket (ringless type or ring type—see tables below) and instruction bulletin. The connection cables from the line bus to the meter socket and from the meter socket to the tenant main disconnect are not included. These should be provided by the contractor.

**Table 5.1: EUSERC Meter Socket with Test Block Kit (Ring Type; Class 2756)**

Voltage System	Poles	Description	Catalog No.		\$ Price
			Single-Phase	3-Phase	
120/240 V, 208Y/120 V, or 240/120 V Delta	AB	Old design: plug on to line side bus	CM522ABE	—	1087.00
	AC		CM522ACE	—	
	BC		CM522BCE	—	
	AC	New design: lugs on line side	CMLL522E	—	
208Y/120 V, 240/120 V Delta, or 480Y/277 V	ABC	Old design: plug on to line side bus	—	CM732E	1349.00
		New design: lugs on line side	—	CMLL732E	

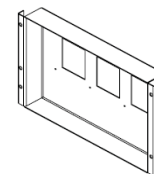
**Table 5.2: Lever Bypass Meter Socket (Ringless Type; Class 2755)**

Voltage System	Poles	Description	Catalog No.		\$ Price
			Single-Phase	3-Phase	
480Y/277 V	ABC	Old design: plug on to line side bus	—	CM732	1349.00
		New design: lugs on line side	—	CMLL732	

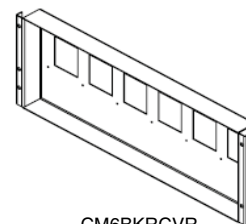
**Table 5.3: Cover and Hardware Kits**

Description	Tenant Main Structure	Catalog No.	\$ Price
<b>CMM Circuit Breaker Cover Kit ▲</b>			
Allows PowerPact® H, J, and Q circuit breakers to be installed in legacy design CMM structures.	3-Socket	CM3BKRCVR	137.00
	6-Socket	CM6BKRCVR	173.00
<b>CMM Meter Cover Kit for EUSERC Applications</b>			
Includes meter cover, test block cover, and hardware.	3-Socket	CM7CR20ER	373.00
	6-Socket	CM7CR32ER	536.00
<b>CMM Meter Cover Kit for Lever Bypass Applications</b>			
Meter socket cover		CM7CR20R ■	419.00
Blank cover		CM20BLK ■	353.00
<b>CMM Universal Hardware Kit</b>			
Required to add any tenant main disconnect.		CMUHWKIT	58.00

- ▲ A new circuit breaker cover is required when adding a PowerPact Q, H, or J circuit breaker to a legacy design tenant metering structure. The new cover has larger openings to accommodate the padlock attachment for these circuit breakers.
- Order point: PDS.



CM3BKRCVR



CM6BKRCVR

For additional information or for custom applications, please contact your local Schneider Electric representative. Or, visit us on the web at [www.schneider-electric.us](http://www.schneider-electric.us).

**Tenant Main Disconnects**

**Table 5.4: Circuit Breakers**

(Universal Hardware Kit CMUHWKIT required; see page 5-2 for ordering information.)

Ampacity	Catalog No.	SCCR		\$ Price	Load Lug Information
		240 V	480 V		
<b>100 A F-frame Circuit Breaker</b>					
60 A	FAL34060	25 kA	18 kA	521.00	#12 - 1/0 AWG Al or Cu
70-100 A	FAL34xxx ▲			616.00	
60 A	FHL36060	65 kA	25 kA	905.00	
70-100 A	FHL36xxx ▲			1027.00	
Padlock Attachment	HPAFK	—	—	16.10	
<b>PowerPact® Q-frame 250 A Circuit Breaker (240 Vac) ■ ◆</b>					
110-200 A	QDL32xxx ★	25 kA	N/A	1189.00	#4 - 300 kcmil Al or Cu
110-200 A	QGL32xxx ★	65 kA	N/A	1628.00	
110-200 A	QJL32xxx ★	100 kA	N/A	1864.00	
Padlock Attachment	QBPAF	—	—	51.50	
<b>PowerPact H-frame 150 A Circuit Breaker (600 Vac, 250 Vdc)</b>					
60 A	HDL36060	25 kA	18 kA	725.00	#4 - 3/0 kcmil Al or Cu
70-100 A	HDL36xxx ▼			885.00	
110-150 A				1733.00	
60 A	HGL36060	65 kA	35 kA	995.00	
70-100 A	HGL36xxx ▼			1134.00	
110-150 A				2399.00	
60 A	HJL36060	100 kA	65 kA	1299.00	
70-100 A	HJL36xxx ▼			1399.00	
110-150 A				3449.00	
60 A	HLL36060	100 kA	100 kA	1899.00	
70-100 A	HLL36xxx ▼			2099.00	
110-150 A				4499.00	
Padlock Attachment	S37422	—	—	51.00	—
<b>PowerPact J-frame 250 A Circuit Breaker (600 Vac, 250 Vdc)</b>					
175-200 A	JDL36xxx △	25 kA	18 kA	1820.00	#4 - 300 kcmil Al or Cu
175-200 A	JGL36xxx △	65 kA	35 kA	2519.00	
175-200 A	JJL36xxx △	100 kA	65 kA	3621.00	
175-200 A	JLL36xxx △	100 kA	100 kA	4724.00	
Padlock Attachment	S37422	—	—	51.00	—

- ▲ To complete the catalog number for these PowerPact F-frame circuit breakers, replace xxx with the required ampacity (070, 080, 090, or 100).
- A shunt trip is not available on PowerPact Q-frame circuit breakers.
- ◆ A new circuit breaker cover is required when adding a PowerPact Q-, H-, or J-frame circuit breaker to an old-design tenant metering structure. This new cover has larger openings to accommodate the padlock attachment for these circuit breakers. See page 2 for ordering information.
- ★ To complete the catalog number for PowerPact Q-frame circuit breakers, replace xxx with the required ampacity (110, 125, 150, 175, or 200).
- ▼ To complete the catalog number for PowerPact H-frame circuit breakers, replace xxx with the required ampacity (070, 080, 090, 100, 110, 125, or 150).
- △ To complete the catalog number for PowerPact J-frame circuit breakers, replace xxx with the required ampacity (175 or 200).



**Class T Fusible Pullouts, CMM Pullout Heads**

**Table 5.5: Class T Fusible Pullouts (Universal Hardware Kit CMUHWKIT Required)**  
(Universal Hardware Kit CMUHWKIT required; see page 5-2 for ordering information.)

Ampacity	Catalog No.	SCCR		\$ Price ■	Wire Size Al or Cu
		240 V ▲	480 V		
100 A	FTL3100	100 kA	N/A	<b>1000.00</b>	#14 - 1/0 AWG
200 A	FTL3200	100 kA	N/A	<b>1045.00</b>	#4 - 250 kcmil
60 A	FTL43060	N/A	100 kA	<b>839.00</b>	#14 - #2
100 A	FTL43100	N/A	100 kA	<b>840.00</b>	#14 - 1/0 AWG
200 A	FTL43200	N/A	100 kA	<b>1877.00</b>	1/0 AWG - 300 kcmil

- ▲ 240 V fusible pullouts cannot be used on a Lever Bypass CMM. Only 480 V pullouts can be used.
- Discount schedules: FTL3100 and FTL3200 = DE5; FTL43060, FTL43100, and FTL43200 = PE1A.

**Table 5.6: CMM Pullout Heads**

Mains			Pullout Head (No Base) Catalog No.	\$ Price ♦
Voltage System	Rating (A)	Poles		
1Ø3W 120/240 V 3Ø4W 240/120 V Delta 3Ø4W 208Y/120 V	100	3	4050707050 ★	<b>196.00</b>
	200	3	4050705950 ★	<b>288.00</b>
3Ø4W 480Y/277 V	60	3	—	—
	100	3	—	—
	200	3	—	—

- ♦ Discount schedule: DE5.
- ★ Order point: Lexington, KY.





Dry Type, General Purpose  
 see pages 6-2 and 6-3



Watchdog® Low Temperature Rise  
 see page 6-3



Type EO  
 see page 6-6



460R Voltage Transformer  
 see page 6-8



260R Rectangular Window  
 Current Transformer  
 see page 6-11



66R Current Transformer  
 see page 6-8



270R Split-Core  
 Current Transformer  
 see page 6-11

**Dry Type, 600 Volts and Below**

Three-Phase, General Purpose Transformers	6-2
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**Three-Phase General Purpose**

General purpose standard transformers are intended for power, heating, and lighting applications.

**NOTE:** These products are obsolete and can no longer be ordered. The information in this table is for reference only.

**Table 6.1: Three-Phase General Purpose Transformer Selection**

kVA	Catalog Number	Full Capacity Taps	°C Temp. Rise	Weight ▲ (lbs)	Enclosure ▲■
<b>480 V Delta Primary, 208Y/120 V Secondary, 60 Hz</b> CULUS Listed					
15	15T3H	6-2.5%2+4-	150	200	17D
30	30T3H	6-2.5%2+4-	150	250	17D
45	45T3H	6-2.5%2+4-	150	340	18D
75	75T3H	6-2.5%2+4-	150	500	19D
112.5	112T3H	6-2.5%2+4-	150	750	21D
150	150T3H	6-2.5%2+4-	150	800	22D
225	225T3H	6-2.5%2+4-	150	1025	24D
300	300T3H	6-2.5%2+4-	150	1450	25D
500	500T68H	4-2.5%2+2-	150	2460	30D
750	750T68H	4-2.5%2+2-	150	3950	31D
1000	1000T77H	2-5%1+1-	150	6300	33F
<b>600 V Delta Primary, 208Y/120 V Secondary, 60 Hz</b> CULUS Listed					
15	15T8H	6-2.5%2+4-	150	200	17D
30	30T8H	6-2.5%2+4-	150	250	17D
45	45T8H	6-2.5%2+4-	150	340	18D
75	75T8H	6-2.5%2+4-	150	500	19D
112.5	112T8H	6-2.5%2+4-	150	750	21D
150	150T8H	6-2.5%2+4-	150	800	22D
225	225T8H	6-2.5%2+4-	150	1025	24D
300	300T8H	6-2.5%2+4-	150	1450	25D
500	500T79H	4-2.5%FCBN ◆	150	2100	30D
750	750T79H	4-2.5%FCBN ◆	150	3950	31D
1000	1000T79H	4-2.5%FCBN ◆	150	6600	33F
<b>208 V Delta Primary, 208Y/120 V Secondary, 60 Hz *</b> CULUS Listed					
15	15T85HIS	3-5%1+2-	150	200	17D
30	15T85HIS	3-5%1+2-	150	250	17D
45	45T85HIS	3-5%1+2-	150	340	18D
75	75T85HIS	3-5%1+2-	150	500	19D
112.5	112T85HIS	3-5%1+2-	150	815	21D
150	150T85HIS	3-5%1+2-	150	800	22D
225	225T85HIS	3-5%1+2-	150	1025	24D
300	300T85HIS	3-5%1+2-	150	1450	25D
500	500T85HIS	3-5%1+2-	150	2100	30D
<b>240 V Delta Primary, 208Y/120 V Secondary, 60 Hz</b> CULUS Listed					
15	15T12H	6 - 2.5% 2+4-	150	200	17D
30	30T12H	6 - 2.5% 2+4-	150	250	17D
45	45T12H	6 - 2.5% 2+4-	150	340	18D
75	75T12H	6 - 2.5% 2+4-	150	500	19D
112.5	112T12H	6 - 2.5% 2+4-	150	750	21D
150	150T12H	6 - 2.5% 2+4-	150	800	22D
225	225T12H	6 - 2.5% 2+4-	150	1025	24D
300	300T12H	6 - 2.5% 2+4-	150	1450	25D
500	500T239H	3 - 5% 1+2-	150	2100	30D
<b>480 V Delta Primary, 240 V Delta Secondary with 120 V Center Tap, 60 Hz ▼</b> UL Listed					
15	15T6HCT	6-2.5%2+4-	150	200	17D
30	30T6HCT	6-2.5%2+4-	150	250	17D
45	45T6HCT	6-2.5%2+4-	150	340	18D
75	75T6HCT	6-2.5%2+4-	150	500	19D
112.5	112T6HCT	6-2.5%2+4-	150	750	21D
150	150T6HCT	6-2.5%2+4-	150	800	22D
225	225T6HCT	6-2.5%2+4-	150	1025	24D
300	300T6HCT	6-2.5%2+4-	150	1450	25D
500	500T6HCT	4-2.5%2+2-	150	2100	30D
750	750T6HCT	4-2.5%2+2-	150	3950	31D
1000	1000T6HCT	2-5%1+1-	150	6000	33F

kVA	Catalog Number	Full Capacity Taps	°C Temp. Rise	Weight ▲ (lbs)	Enclosure ▲■
<b>208 V Delta Primary, 480Y/277 V Secondary, 60 Hz</b> CULUS Listed					
15	15T64H	2-5%FCBN ◆	150	200	17D
30	30T64H	2-5%FCBN ◆	150	250	17D
45	45T64H	2-5%FCBN ◆	150	340	18D
75	75T64H	2-5%FCBN ◆	150	500	19D
112.5	112T64H	2-5%FCBN ◆	150	750	21D
150	150T64H	2-5%FCBN ◆	150	800	22D
225	225T64H	2-5%FCBN ◆	150	1025	24D
300	300T64H	2-5%FCBN ◆	150	1450	25D
500	500T64H	2-5%FCBN ◆	150	2100	30D
<b>480 V Delta Primary, 480Y/277 V Secondary, 60 Hz</b> CULUS Listed					
15	15T76H	4-2.5%2+2-	150	200	17D
30	30T76H	4-2.5%2+2-	150	250	17D
45	45T76H	4-2.5%2+2-	150	340	18D
75	75T76H	4-2.5%2+2-	150	500	19D
112.5	112T76H	4-2.5%2+2-	150	750	21D
150	150T76H	4-2.5%2+2-	150	800	22D
225	225T76H	4-2.5%2+2-	150	1025	24D
300	300T76H	4-2.5%2+2-	150	1450	25D
500	500T76H	4-2.5%2+2-	150	2100	30D

- ▲ Not for construction. Contact your nearest Schneider Electric sales office for certified prints.
- For enclosure styles, see Dimensions Table, page 6.
- ◆ FCBN = full capacity below normal
- ★ These are electrostatically shielded transformers, as indicated by the letters IS at the end of catalog number.
- ▼ **Caution:** Single Phase load is limited to maximum 5% of rated kVA. Contact your nearest Schneider Electric sales office for other loading.

**NOTE:** Lugs are furnished by customer.  
Taps on transformers 225 kVA and larger may vary in 3-5% steps to obtain best design.

**Three-Phase Copper Wound**

All Square D® brand transformers are available with optional copper windings.

**NOTE:** These products are obsolete and can no longer be ordered. The information in this table is for reference only.

**Table 6.2: Three-Phase Copper Wound Transformer Selection**

kVA	Catalog Number	Full Capacity Taps	°C Temp. Rise	Weight▲ (lbs)	Enclosure ▲■
<b>480 V Delta Primary, 208Y/120 V Secondary, 60 Hz</b> CULUS Listed. Copper Windings					
15	15T3HCU	6-2.5%2 + 4-	150	240	17D
30	30T3HCU	6-2.5%2 + 4-	150	300	17D
45	45T3HCU	6-2.5%2 + 4-	150	385	18D
75	75T3HCU	6-2.5%2 + 4-	150	600	19D
112.5	112T3HCU	6-2.5%2 + 4-	150	780	21D
150	150T3HCU	6-2.5%2 + 4-	150	1100	22D
225	225T3HCU	6-2.5%2 + 4-	150	1300	24D
300	300T3HCU	6-2.5%2 + 4-	150	1800	25D
500	500T68HCU	4-2.5%2 + 2-	150	2550	30D
750	750T68HCU	4-2.5%2 + 2-	150	4800	31D
<b>480 V Delta Primary, 240 V Delta Secondary, 60 Hz</b> CULUS Listed. Copper Windings					
15	15T6HCU	6-2.5%2 + 4-	150	240	17D
30	30T6HCU	6-2.5%2 + 4-	150	300	17D
45	45T6HCU	6-2.5%2 + 4-	150	385	18D
75	75T6HCU	6-2.5%2 + 4-	150	600	19D
112.5	112T6HCU	6-2.5%2 + 4-	150	780	21D
150	150T6HCU	6-2.5%2 + 4-	150	1100	22D
225	225T6HCU	6-2.5%2 + 4-	150	1700	4D
300	300T6HCU	6-2.5%2 + 4-	150	1800	25D
500	500T63HCU	4-2.5%2 + 2-	150	2550	30D

**Dry Type 600 Volts and Below**

**Single-Phase, General Purpose**

General purpose standard transformers are intended for power, heating, lighting, and light-duty control applications.

**NOTE:** These products are obsolete and can no longer be ordered. The information in this table is for reference only.

**Table 6.3: Single-Phase, General Purpose Transformer Selection**

kVA	Catalog Number	Full Capacity Taps	°C Temp. Rise	Weight▲ (lbs)	Enclosure ▲ ■
<b>240 X 480 V Primary, 120/240 V Secondary, 60 Hz</b> CULUS Listed through 167 kVA					
15	15S1H	6-2.5%2+4-◆	150	200	17D
25	25S3H	6-2.5%2+4-◆	150	245	17D
37.5	37S3H	6-2.5%2+4-◆	150	325	18D
50	50S3H	6-2.5%2+4-◆	150	350	18D
75	75S3H	6-2.5%2+4-◆	150	450	21D
100	100S3H	6-2.5%2+4-◆	150	640	22D
167	167S3H	6-2.5%2+4-◆	150	975	24D
250	200S3H	6-2.5%2+4-◆	150	1220	25D
333	250S3H	6-2.5%2+4-◆	150	1535	25D
<b>600 V Primary, 120/240 V Secondary, 60 Hz</b> CULUS Listed through 167 kVA					
15	15S5H	6-2.5%2+4-◆	150		17D
25	25S5H	6-2.5%2+4-◆	150	245	17D
37.5	37S5H	6-2.5%2+4-◆	150	325	18D
50	50S5H	6-2.5%2+4-◆	150	350	18D
75	75S5H	6-2.5%2+4-◆	150	450	21D
100	100S5H	6-2.5%2+4-◆	150	640	22D
167	167S5H	6-2.5%2+4-◆	150	975	24D
250	250S5H	6-2.5%2+4-◆	150	1220	25D
333	333S5H	6-2.5%2+4-◆	150	1535	25D
<b>208 V Primary, 120/240 V Secondary, 60 Hz</b> CULUS Listed through 167 kVA					
15	15S60H	2-5%FCBN★	150	205	17D
25	25S60H	2-5%FCBN★	150	240	17D
37.5	37S60H	2-5%FCBN★	150	325	18D
50	50S60H	2-5%FCBN★	150	350	18D
75	75S60H	2-5%FCBN★	150	450	21D
100	100S60H	2-5%FCBN★	150	640	22D
167	167S60H	2-5%FCBN★	150	975	24D
<b>277 V Primary, 120/240 V Secondary, 60 Hz</b> CULUS Listed through 167 kVA					
15	15S61H	2-5%FCBN★	150	205	17D
25	25S61H	2-5%FCBN★	150	240	17D
37.5	37S61H	2-5%FCBN★	150	325	18D
50	50S61H	2-5%FCBN★	150	350	18D
75	75S61H	2-5%FCBN★	150	450	21D
100	100S61H	2-5%FCBN★	150	640	22D
167	167S61H	2-5%FCBN★	150	975	24D

- ▲ Not for construction. Contact your nearest Schneider Electric sales office for certified prints.
- For enclosure styles, see Dimensions Table, page 6.
- ◆ When 240 volt connection is used, there will be 3-5% taps, 1 above and 2 below 240 volts.
- ★ FCBN = full capacity below normal

**NOTE:** Lugs are furnished by customer.

**Single-Phase and Watchdog®**

Class 7400 / Refer to Catalogs 7400CT0601, 7400CT9601

**Watchdog® Low Temperature Rise**

- Designed for low energy losses at loads greater than 50% of nameplate rating.
- Extra long life expectancy using 220 °C insulation system designed for full load operation at a maximum temperature rise of 115 °C or 80 °C instead of 150 °C.
- Continuous emergency overload capability of 15% on 115 °C rise and 30% on 80 °C rise.

**NOTE:** These products are obsolete and can no longer be ordered. The information in this table is for reference only.

**Table 6.4: Watchdog Low Temperature Rise Transformer Selection**

kVA	Catalog Number	Full Capacity Taps	Weight▲ (lbs)	Enclosure ▲ ■
<b>115 °C Rise Single Phase – 240x480 V Primary 120/240 V Secondary 60 Hz</b> CULUS Listed				
15	15S3HF	6-2.5%2+4-◆	230	17D
25	25S3HF	6-2.5%2+4-◆	325	18D
37.5	37S3HF	6-2.5%2+4-◆	350	18D
50	50S3HF	6-2.5%2+4-◆	450	21D
75	75S3HF	6-2.5%2+4-◆	650	22D
100	100S3HF	6-2.5%2+4-◆	1050	24D
<b>80 °C Rise Single Phase – 240x480 V Primary 120/240 V Secondary 60 Hz</b> CULUS Listed				
15	15S3HB	6-2.5%2+4-◆	230	17D
25	25S3HB	6-2.5%2+4-◆	325	18D
37.5	37S3HB	6-2.5%2+4-◆	350	18D
50	50S3HB	6-2.5%2+4-◆	450	21D
75	75S3HB	6-2.5%2+4-◆	675	22D
100	100S3HB	6-2.5%2+4-◆	1100	24D
<b>115 °C Rise Three Phase – 480 V Delta Primary 208Y/120 V Secondary 60 Hz</b> CULUS Listed				
15	15T3HF	6-2.5%2+4-	250	17D
30	30T3HF	6-2.5%2+4-	340	18D
45	45T3HF	6-2.5%2+4-	500	19D
75	75T3HF	6-2.5%2+4-	620	21D
112.5	112T3HF	6-2.5%2+4-	800	22D
150	150T3HF	6-2.5%2+4-	1025	24D
225	225T3HF	6-2.5%2+4-	1450	25D
300	300T3HF	6-2.5%2+4-	2460	30D
500	500T68HF	6-2.5%2+4-	3950	31D
<b>115 °C Rise Three Phase – 480 V Delta Primary 208Y/120 V Secondary 60 Hz</b> CULUS Listed, Copper Windings				
15	15T3HFCU	6-2.5%2+4-	250	17D
30	30T3HFCU	6-2.5%2+4-	340	18D
45	45T3HFCU	6-2.5%2+4-	500	19D
75	75T3HFCU	6-2.5%2+4-	620	21D
112.5	112T3HFCU	6-2.5%2+4-	800	22D
150	150T3HFCU	6-2.5%2+4-	1025	24D
225	225T3HFCU	6-2.5%2+4-	1450	25D
300	300T3HFCU	6-2.5%2+4-	2460	30D
500	500T68HFCU	6-2.5%2+4-	3950	31D
<b>80 °C Rise Three Phase – 480 V Delta Primary 208Y/120 V Secondary 60 Hz</b> CULUS Listed				
15	15T3HB	6-2.5%2+4-	250	17D
30	30T3HB	6-2.5%2+4-	340	18D
45	45T3HB	6-2.5%2+4-	500	19D
75	75T3HB	6-2.5%2+4-	750	21D
112.5	112T3HB	6-2.5%2+4-	850	22D
150	150T3HB	6-2.5%2+4-	1075	24D
225	225T3HB	6-2.5%2+4-	1450	25D
300	300T3HB	6-2.5%2+4-	2460	30D
500	500T68HB	6-2.5%2+4-	3950	31D
<b>80 °C Rise Three Phase – 480 V Delta Primary 208Y/120 V Secondary 60 Hz</b> CULUS Listed, Copper Windings				
15	15T3HBCU	6-2.5%2+4-	250	17D
30	30T3HBCU	6-2.5%2+4-	340	18D
45	45T3HBCU	6-2.5%2+4-	500	19D
75	75T3HBCU	6-2.5%2+4-	750	21D
112.5	112T3HBCU	6-2.5%2+4-	850	22D
150	150T3HBCU	6-2.5%2+4-	1075	24D
225	225T3HBCU	6-2.5%2+4-	1450	25D
300	300T3HBCU	6-2.5%2+4-	2460	30D
500	500T68HBCU	6-2.5%2+4-	3950	31D

TRANSFORMERS  
**6**

**Transformers Designed for High Harmonic Loads—NL and NLP Series**

- Three phase dry type transformers, 480 Delta—208Y/120
- Aluminum or Copper windings
- Electrostatic shield
- Class 220 insulation
- NLP Series has maximum sound level 3dB below NEMA Standard
- 115 °C temperature rise standard ; available with optional 80 °C temperature rise. ♦
- Double size neutral terminal for additional customer neutral cables
- Additional coil capacity to compensate for higher non-linear load loss
- Heavy gauge ventilated indoor enclosures (weathershields available)
- cULus Listed

**NOTE:** These products are obsolete and can no longer be ordered. The information in this table is for reference only.

**Table 6.5: NL and NLP Series Transformers**

kVA	Catalog Number	Taps	Weight▲ (lbs)	Enclosure▲■
<b>NL Series for Typical Non-Linear Load Service</b>				
K-4 Rated—Aluminum Windings, 115 °C Rise				
15	15T3HFISNL	6-2.5% 2+4-	240	17D
30	30T3HFISNL	6-2.5% 2+4-	300	18D
45	45T3HFISNL	6-2.5% 2+4-	500	19D
75	75T3HFISNL	6-2.5% 2+4-	725	21D
112.5	112T3HFISNL	6-2.5% 2+4-	800	22D
150	150T3HFISNL	6-2.5% 2+4-	985	24D
225	225T3HFISNL	6-2.5% 2+4-	1450	25D
300	300T68HFISNL	4-2.5% 2+2-	1725	30D
500	500T68HFISNL	4-2.5% 2+2-	3600	31D
<b>NLP Series for More Severe Non-Linear Load Service</b>				
K-13 Rated—Aluminum Windings, 115 °C Rise				
15	15T3HFISNLP	6-2.5% 2+4-	245	17D
30	30T3HFISNLP	6-2.5% 2+4-	350	18D
45	45T3HFISNLP	6-2.5% 2+4-	600	19D
75	75T3HFISNLP	6-2.5% 2+4-	725	22D
112.5	112T3HFISNLP	6-2.5% 2+4-	850	22D
150	150T3HFISNLP	6-2.5% 2+4-	1380	25D
225	225T3HFISNLP	6-2.5% 2+4-	2010	25D
300	300T68HFISNLP	4-2.5% 2+2-	2100	30D
500	500T68HFISNLP	4-2.5% 2+2-	4000	31D
<b>NL Series for Typical Non-Linear Load Service</b>				
K-4 Rated—Copper Windings, 115 °C Rise				
30	30T3HFISCUNL	6-2.5% 2+4-	380	18D
45	45T3HFISCUNL	6-2.5% 2+4-	475	18D
75	75T3HFISCUNL	6-2.5% 2+4-	865	21D
112.5	112T3HFISCUNL	6-2.5% 2+4-	925	22D
150	150T3HFISCUNL	6-2.5% 2+4-	1275	24D
225	225T3HFISCUNL	6-2.5% 2+4-	1700	25D
300	300T68HFISCUNL	4-2.5% 2+2-	2750	25D
<b>NLP Series for More Severe Non-Linear Load Service</b>				
K-13 Rated—Copper Windings, 115 °C Rise				
15	15T3HFISCUNLP	6-2.5% 2+4-	310	17D
30	30T3HFISCUNLP	6-2.5% 2+4-	370	18D
45	45T3HFISCUNLP	6-2.5% 2+4-	600	19D
75	75T3HFISCUNLP	6-2.5% 2+4-	875	22D
112.5	112T3HFISCUNLP	6-2.5% 2+4-	1100	22D
150	150T3HFISCUNLP	6-2.5% 2+4-	1500	25D
225	225T3HFISCUNLP	6-2.5% 2+4-	2450	25D
300	300T68HFISCUNLP	4-2.5% 2+2-	2600	30D

kVA	Catalog Number	Taps	Weight▲ (lbs)	Enclosure▲■
<b>NL Series for Typical Non-Linear Load Service</b>				
K-4 Rated—Aluminum Windings, 150 °C Rise				
15	15T3HISNL	6-2.5% 2+4-	250	17D
30	30T3HISNL	6-2.5% 2+4-	340	18D
45	45T3HISNL	6-2.5% 2+4-	500	19D
75	75T3HISNL	6-2.5% 2+4-	750	21D
112.5	112T3HISNL	6-2.5% 2+4-	800	22D
150	150T3HISNL	6-2.5% 2+4-	1025	24D
225	225T3HISNL	6-2.5% 2+4-	1450	25D
300	300T68HISNL	4-2.5% 2+2-	2100	30D
500	500T68HISNL	4-2.5% 2+2-	3950	31D
<b>NLP Series for More Severe Non-Linear Load Service</b>				
K-13 Rated—Aluminum Windings, 150 °C Rise				
15	15T3HISNLP	6-2.5% 2+4-	250	17D
30	30T3HISNLP	6-2.5% 2+4-	340	18D
45	45T3HISNLP	6-2.5% 2+4-	500	19D
75	75T3HISNLP	6-2.5% 2+4-	750	21D
112.5	112T3HISNLP	6-2.5% 2+4-	800	22D
150	150T3HISNLP	6-2.5% 2+4-	1025	24D
225	225T3HISNLP	6-2.5% 2+4-	1450	25D
300	300T68HISNLP	4-2.5% 2+2-	2100	30D
500	500T68HISNLP	4-2.5% 2+2-	3950	31D
<b>NL Series for Typical Non-Linear Load Service</b>				
K-4 Rated—Copper Windings, 150 °C Rise				
30	30T3HISCUNL	6-2.5% 2+4-	380	18D
45	45T3HISCUNL	6-2.5% 2+4-	475	18D
75	75T3HISCUNL	6-2.5% 2+4-	865	21D
112.5	112T3HISCUNL	6-2.5% 2+4-	925	22D
150	150T3HISCUNL	6-2.5% 2+4-	1275	24D
225	225T3HISCUNL	6-2.5% 2+4-	1700	25D
300	300T68HISCUNL	4-2.5% 2+2-	2750	25D
<b>NLP Series for More Severe Non-Linear Load Service</b>				
K-13 Rated—Copper Windings, 150 °C Rise				
15	15T3HISCUNLP	6-2.5% 2+4-	310	17D
30	30T3HISCUNLP	6-2.5% 2+4-	370	18D
45	45T3HISCUNLP	6-2.5% 2+4-	600	19D
75	75T3HISCUNLP	6-2.5% 2+4-	875	21D
112.5	112T3HISCUNLP	6-2.5% 2+4-	1100	22D
150	150T3HISCUNLP	6-2.5% 2+4-	1500	25D
225	225T3HISCUNLP	6-2.5% 2+4-	2450	25D
300	300T68HISCUNLP	4-2.5% 2+2-	2600	30D

- ▲ Not for construction. Contact your nearest Schneider Electric sales office for certified prints.
- For enclosure styles, see Dimensions Table, 6-6.
- ♦ To order with optional 80 °C temperature rise, replace "F" in catalog number with "B". **Example:** 15T3HBISNL.

**NOTE:** Lugs are furnished by customer.

**Open Core and Coil Transformers Designed for General Applications for 600 V and Below**

Units are designed with 220 °C insulation, aluminum windings, top terminations, compact design to save space, and are UL component recognized for:

- Non-energy efficiency (less than 15 kVA)  
Single-phase 5–10 VA  
Three-phase 3–9 VA
- Energy efficiency (meets Table 4-2 of NEMA TP1–2002)  
Single-phase 15–75 kVA  
Three-phase 15–112.5 kVA

**Table 6.1: Single-Phase Open Core and Coil Transformers—240 X 480 V Primary 120/240 V Secondary 60 Hz**

kVA	Catalog No.	\$ Price	Deg. C Temp. Rise	Full Capacity Taps	Dimensions ▲										Weight (lbs)	Figure
					A		B		C		D		E■			
					in	mm	in	mm	in	mm	in	mm	in	mm		
5	5S1HFOC	2868.00	115	—	8.00	203	9.00	229	11.00	279	8.00	203	8.00	203	66	1
7.5	7S1HFOC	3062.00	115	—	8.00	203	9.00	229	14.25	362	8.00	203	8.50	216	80	1
10	10S1HFOC	3396.00	115	—	20.50	521	18.5	470	14.00	356	17.0	432	4.25	108	140	2
15	EE15S3HOC	3072.00	150	6–2.5% 2+4—■	20.50	521	18.5	470	14.00	356	17.0	432	4.25	108	140	2
25	EE25S3HOC	4151.00	150	6–2.5% 2+4—■	20.25	514	18.5	470	14.00	356	17.0	432	5.00	127	200	2
37.5	EE37S3HOC	5534.00	150	6–2.5% 2+4—■	22.00	559	18.5	470	18.00	457	17.0	432	5.50	140	255	2
50	EE50S3HOC	6731.00	150	6–2.5% 2+4—■	22.00	559	18.5	470	18.00	457	17.0	432	6.50	165	310	2
75	EE75S3HOC	9128.00	150	6–2.5% 2+4—■	22.25	565	28.0	711	22.00	559	27.0	686	8.50	216	460	2

▲ Not for construction. Contact your local Schneider Electric sales office for certified prints.  
■ When 240 V tap is used, there will be 3–5% taps, 1 above and 2 below.

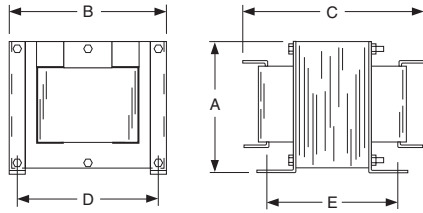


Figure 1

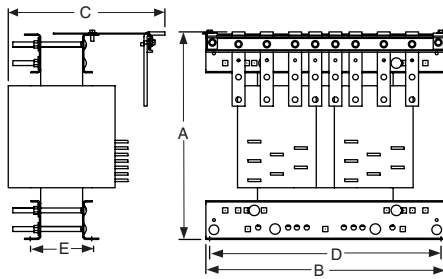


Figure 2

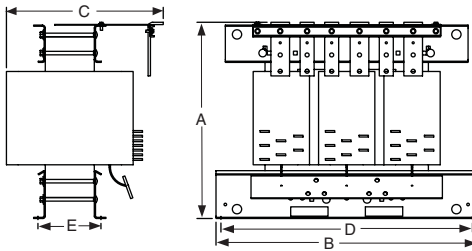
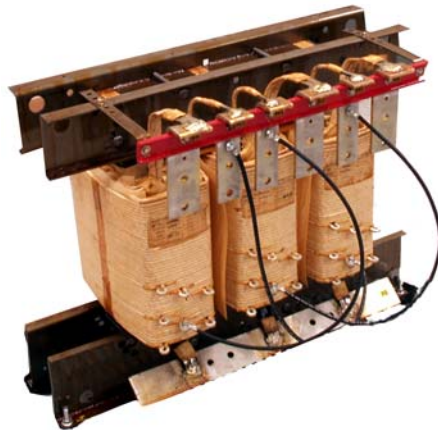


Figure 3



**Table 6.2: Three Phase Open Core and Coil Transformers—480 V to 208Y/120 240 V to 208Y/120**

kVA	Catalog No.	\$ Price	Degree C Temp. Rise	Dimensions ▲										Weight (lbs)	Figure
				A		B		C		D		E■			
				in	mm	in	mm	in	mm	in	mm	in	mm		
9	9T3HFOC	3424.00	115	14.75	375	18.50	470	14.00	356	17.00	432	5.13	130	145	3
15	EE15T3HOC	4532.00	150	14.75	375	18.50	470	14.00	356	17.00	432	5.13	130	145	3
30	EE30T3HOC	6799.00	150	16.50	419	18.50	470	14.00	356	17.00	432	5.88	149	185	3
45	EE45T3HOC	6234.00	150	17.25	438	18.50	470	18.00	457	17.00	432	6.50	165	285	3
75	EE75T3HOC	9393.00	150	21.00	533	28.00	711	18.00	457	26.94	684	6.75	171	450	3
112.5	EE112T3HOC	12513.00	150	21.75	552	28.00	711	22.00	559	26.94	684	6.75	171	460	3

**240 V to 208Y/120**

kVA	Catalog No.	\$ Price	Degree C Temp. Rise	Dimensions ▲										Weight (lbs)	Figure
				A		B		C		D		E■			
				in	mm	in	mm	in	mm	in	mm	in	mm		
9	9T67HFOC	3424.00	115	14.75	375	18.50	470	14.00	356	17.00	432	5.13	130	165	3
15	EE15T67HOC	4434.00	150	14.75	375	18.50	470	14.00	356	17.00	432	5.13	130	165	3
30	EE30T67HOC	5828.00	150	16.50	419	18.50	470	14.00	356	17.00	432	5.88	149	185	3
45	EE45T67HOC	7013.00	150	17.25	438	18.50	470	18.00	457	17.00	432	6.50	165	295	3
75	EE75T67HOC	10567.00	150	21.00	533	28.00	711	18.00	457	27.00	686	6.38	162	450	3
112.5	EE112T67HOC	14077.00	150	21.75	552	28.00	711	22.00	559	27.00	686	6.38	162	460	3

**600 V to 208Y/120**

kVA	Catalog No.	\$ Price	Degree C Temp. Rise	Dimensions ▲										Weight (lbs)	Figure
				A		B		C		D		E■			
				in	mm	in	mm	in	mm	in	mm	in	mm		
9	9T65HFOC	3424.00	115	14.75	375	18.50	470	14.00	356	17.00	432	5.13	130	165	3
15	EE15T65HOC	5122.00	150	14.75	375	18.50	470	14.00	356	17.00	432	5.13	130	165	3
30	EE30T65HOC	7683.00	150	16.50	419	18.50	470	14.00	356	17.00	432	5.88	149	215	3
45	EE45T65HOC	7013.00	150	17.25	438	18.50	470	18.00	457	17.00	432	6.50	165	290	3
75	EE75T65HOC	10567.00	150	21.00	533	28.00	711	18.00	457	27.00	686	6.75	171	445	3
112.5	EE112T65HOC	14077.00	150	21.75	552	28.00	711	22.00	559	27.00	686	6.75	171	450	3

▲ Not for construction. Contact your local Schneider Electric sales office for certified prints.  
■ Dimensions may vary due to manufacturing process.

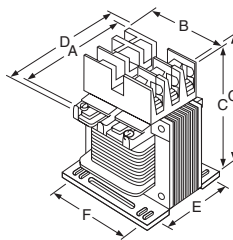
Type EO units are designed with exceptional voltage regulation. These control transformers are constructed using traditional materials and manufacturing techniques, and are designed for 25–5000 VA with a 55 °C temperature rise. When exceptional regulation and very low temperature rise are an absolute necessity, choose Type EO units.

**Table 6.8: Regulation Chart for Type EO Transformers**

VA (60 Hz)	Secondary Voltage					
	Inrush UL VA at 20% Power Factor			Inrush UL VA at 40% Power Factor		
	95%	90%	85%	95%	90%	85%
25	95	—	146	60	—	119
50	164	213	277	123	168	225
75	387	487	622	284	375	798
100	479	606	770	346	463	613
150	755	1177	1532	567	930	1252
200	1260	1883	2419	910	1462	1950
250	1530	2327	2995	1115	1811	2419
300	2030	2981	3800	1455	2290	3038
350	2920	4586	5981	2180	3637	4903
500	4230	5984	7707	3120	4661	6229
750	7430	11460	14736	5380	8907	11891
1000	10300	16873	21734	7450	13145	17571
1500	19200	30042	39217	14500	23859	32179
2000	27750	45194	60022	21750	36901	50994
3000	31800	82333	108205	26750	66072	89509
5000	86100	148768	202077	72600	126887	175552

**Table 6.9: Type EO Transformer Dimensions**

VA (60 Hz)	Catalog Number Class 9070	\$ Price	A		B		C		Weight	
			IN	mm	IN	mm	IN	mm	lbs	kg
<b>220x440 V Primary, 110 V Secondary; 230x460 V Primary, 115 V Secondary; or 240x480 V Primary, Secondary 120</b>										
25	9070EO17D1	79.00	3.31	84	3.00	76	2.50	64	1.9	0.9
50	9070EO1D1	99.00	3.31	84	3.00	76	2.50	64	2.2	1.0
75	9070EO18D1	114.00	3.78	96	3.38	86	2.81	71	3.5	1.6
100	9070EO2D1	136.00	3.78	96	3.38	86	2.81	71	3.8	1.7
150	9070EO3D1	153.00	4.44	113	3.75	95	3.13	80	6.0	2.7
200	9070EO19D1	214.00	4.81	122	4.50	114	3.75	95	10.5	4.8
250	9070EO15D1	250.00	5.19	132	4.50	114	3.75	95	13.2	6.0
300	9070EO04D1	300.00	5.56	141	4.50	114	3.75	95	17.2	7.8
500	9070EO51D1	333.00	6.56	167	5.25	133	4.38	111	24.5	11.1
750	9070EO61D1	473.00	7.94	202	5.25	133	4.38	111	30.5	13.8
1000	9070EO71D1	543.00	7.94	202	6.00	152	5.00	127	45.0	20.4
1500	9070EO81D1	831.00	8.59	218	7.06	179	6.03	153	56.0	25.4
2000	9070EO91D1	1007.00	9.22	234	7.06	179	6.03	153	72.0	32.7
3000	9070EO10D1	1365.00	9.44	239	9.00	229	7.50	191	115.0	52.2
<b>240x480 V Primary, 24 V Secondary</b>										
25	9070EO17D2	79.00	3.31	84	3.00	76	2.50	64	1.9	0.9
50	9070EO10D2	99.00	3.31	84	3.00	76	2.50	64	2.2	1.0
75	9070EO18D2	114.00	3.78	96	3.38	86	2.81	71	3.5	1.6
100	9070EO2D2	136.00	3.78	96	3.38	86	2.81	71	3.8	1.7
250	9070EO16D2	295.00	6.19	157	4.50	114	3.75	95	13.2	6.0
<b>550 V Primary, 110 V Secondary; 575 V Primary, 115 V Secondary; or 600 V Primary, 120 V Secondary;</b>										
200	9070EO19D5	214.00	5.56	4.81	122	4.50	114	3.75	10.5	4.8
300	9070EO04D5	276.00	5.56	141	4.50	114	3.75	95	17.2	7.8
500	9070EO51D5	333.00	6.56	167	5.25	133	4.38	111	24.5	11.1
750	9070EO61D5	473.00	7.94	202	5.25	133	4.38	111	30.5	13.8



▲ Appended catalog number example: 9070EO61D5

**Type T and MultiTap™ Transformers**

Type T transformers are designed with low impedance windings for excellent voltage regulation and can accommodate the high inrush current associated with contactors, starters, solenoids, and relays. As the most popular and complete line of control transformers with unmatched design innovations for top performance, Type Ts are manufactured using the most advanced insulating materials and are the best choice if size and cost are of concern. It is available in the MultiTap version, designed to respond to the increased need for voltage and stock flexibility. It combines multiple primary voltages with one or more secondary voltages, all in a single transformer.

**Selection Guide**

1. Determine the inrush and sealed VA of each coil in the control circuit, and the VA of all other components.
2. Total the sealed VA of all operating coils and the VA of all other loads. (This determines the minimal VA size required for the circuit.)
3. Total the inrush VA of all coils that are starting at the same time, and all loads and coils that are running. (Use the regulation chart to give possible units to be used.)
4. Taking the VA size from step 2, go to the standard VA size in the chart. Make sure the inrush VA from the chart is greater than the total VA from step 3. (If not, go to the next larger VA size and repeat.)

If your supply voltage is stable and fluctuates less than 5%, we recommend you use the 90% secondary voltage column. If your supply voltage is not stable and fluctuates more than 10%, we recommend you use the 95% secondary voltage column. We recommend that you never use the 85% secondary voltage column since magnetic devices lose life expectancy if they are continuously started at 85% of rated voltage.

**Table 6.10: Regulation Chart for Type T Transformers**

VA (60 Hz)	Secondary Voltage					
	Inrush UL VA at 20% Power Factor			Inrush UL VA at 40% Power Factor		
	95%	90%	85%	95%	90%	85%
50	193	266	339	151	215	282
75	271	396	20	210	318	430
100	339	499	659	266	404	549
150	666	893	1120	529	731	942
200	588	815	1041	459	659	866
250	1416	1910	2388	1057	1494	1936
300	1634	2184	2709	1194	1681	2169
350	1894	2592	3261	1392	2005	621
500	3197	4104	4981	2374	3195	4019
750	3770	5515	7231	2887	4391	5945
1000	6587	9079	11430	4706	6886	9051
1500	19324	23983	28607	15066	19361	23756
2000	31384	38777	6161	24794	31630	38667
3000	26539	39934	52713	19355	30721	42216
5000	53111	85265	116277	39368	66309	93882

**Table 6.11: Type T Transformer Selection**

VA UL/ CSA/ NOM	CE	Catalog No.	\$ Price	H	W	D	Weight (lbs)
				in (mm)	in (mm)	in (mm)	
<b>Primary 600 Secondary 120; Primary 575 Secondary 115; or Primary 550 Secondary 110</b>							
50	50	9070T50D5	135.00	2.58 (65.5)	3.00 (76.2)	3.09 (78.5)	2.5
75	75	9070T75D5	162.00	2.89 (73.4)	3.38 (85.8)	3.34 (84.8)	3.8
100	100	9070T100D5	182.00	2.89 (73.4)	3.38 (85.8)	3.34 (84.8)	3.8
150	150	9070T150D5	230.00	3.20 (81.3)	3.75 (95.3)	3.59 (91.2)	5.5
200	200	9070T200D5	293.00	3.20 (81.3)	3.75 (95.3)	3.59 (91.2)	5.5
250	160	9070T250D5	363.00	3.25 (82.6)	3.75 (95.3)	5.25 (133.4)	7.1
300	200	9070T300D5	372.00	3.80 (96.5)	4.50 (114.3)	4.70 (119.4)	8.5
350	250	9070T350D5	432.00	3.80 (96.5)	4.50 (114.3)	5.09 (129.3)	10.5
500	300	9070T500D5	471.00	3.80 (96.5)	4.50 (114.3)	5.46 (138.7)	11.9
750	500	9070T750D5	665.00	4.43 (112.5)	5.25 (133.4)	5.66 (143.8)	11.0
1000	630	9070T1000D5	837.00	4.43 (112.5)	5.25 (133.4)	6.04 (153.4)	20.6
1500	1000	9070T1500D5	1170.00	6.16 (156.5)	7.06 (179.3)	5.81 (147.6)	34.0
2000	1500	9070T2000D5	1358.00	6.16 (156.5)	7.06 (179.3)	7.04 (178.8)	47.0
3000	2000	9070T3000D5	1914.00	8.46 (214.9)	9.00 (228.6)	6.86 (174.2)	60.0
5000	3000	9070T5000D5	3015.00	8.46 (214.9)	9.00 (228.6)	8.73 (221.7)	89.0

**Table 6.11: Type T Transformer Selection**

VA UL/ CSA/ NOM	CE	Catalog No.	\$ Price	H	W	D	Weight (lbs)
				in (mm)	in (mm)	in (mm)	
<b>Primary 480 Secondary 240</b>							
50	50	9070T50D12	135.00	2.58 (65.5)	3.00 (76.2)	3.09 (78.5)	2.5
75	75	9070T75D12	162.00	2.89 (73.4)	3.38 (85.8)	3.34 (84.8)	3.8
100	100	9070T100D12	182.00	2.89 (73.4)	3.38 (85.8)	3.34 (84.8)	3.8
150	150	9070T150D12	230.00	3.20 (81.3)	3.75 (95.3)	3.59 (91.2)	5.5
200	200	9070T200D12	293.00	3.20 (81.3)	3.75 (95.3)	3.59 (91.2)	5.5
250	160	9070T250D12	363.00	3.25 (82.6)	3.75 (95.3)	5.25 (133.4)	7.1
300	200	9070T300D12	372.00	3.80 (96.5)	4.50 (114.3)	4.70 (119.4)	8.5
350	250	9070T350D12	432.00	3.80 (96.5)	4.50 (114.3)	5.09 (129.3)	10.5
500	300	9070T500D12	471.00	3.80 (96.5)	4.50 (114.3)	5.46 (138.7)	11.9
750	500	9070T750D12	665.00	4.43 (112.5)	5.25 (133.4)	5.66 (143.8)	11.0
1000	630	9070T1000D12	837.00	4.43 (112.5)	5.25 (133.4)	6.04 (153.4)	20.6
1500	1000	9070T1500D12	1170.00	6.16 (156.5)	7.06 (179.3)	5.81 (147.6)	34.0
2000	1500	9070T2000D12	1358.00	6.16 (156.5)	7.06 (179.3)	7.04 (178.8)	47.0
3000	2000	9070T3000D12	1914.00	8.46 (214.9)	9.00 (228.6)	6.86 (174.2)	60.0
5000	3000	9070T5000D12	3015.00	8.46 (214.9)	9.00 (228.6)	8.73 (221.7)	89.0

**Type TF Transformers**

Schneider Electric offers Type TF transformers with factory-installed overcurrent protection fuse blocks. The Type TF transformer consists of two primary fuse blocks and one secondary fuse block, a configuration that meets the majority of overcurrent needs by panel builders and machinery OEMs.

Since the fuse blocks are pre-wired and mounted on top of the transformer, the Type TF transformer has the same footprint as the Type T transformer. This design frees up space normally used for separate fuse blocks.

Schneider Electric also offers an extensive fuse block offering for custom applications.

**Table 6.12: Type TF Transformer Selection**

VA UL/ CSA/ NOM	CE	Catalog No.	\$ Price	H	W	D	Weight (lbs)
				in (mm)	in (mm)	in (mm)	
<b>Primary 600 Secondary 120; Primary 575 Secondary 115; or Primary 550 Secondary 110</b>							
50	50	9070TF50D5	185.00	4.00 (101.6)	3.00 (76.2)	3.09 (78.5)	2.5
75	75	9070TF75D5	477.00	4.25 (107.9)	3.38 (85.8)	3.34 (84.8)	3.8
100	100	9070TF100D5	230.00	4.25 (107.9)	3.38 (85.8)	3.34 (84.8)	3.8
150	150	9070TF150D5	276.00	4.55 (115.6)	3.75 (95.3)	3.59 (91.2)	5.5
200	200	9070TF200D5	293.00	4.55 (115.6)	3.75 (95.3)	3.59 (91.2)	5.5
250	160	9070TF250D5	687.00	4.55 (115.6)	3.75 (95.3)	5.25 (133.4)	7.1
300	200	9070TF300D5	486.00	5.10 (129.6)	4.50 (114.3)	4.70 (119.4)	8.5
350	250	9070TF350D5	696.00	5.10 (129.6)	4.50 (114.3)	5.09 (129.3)	10.5
500	300	9070TF500D5	522.00	5.10 (129.6)	4.50 (114.3)	5.46 (138.7)	11.9
750	500	9070TF750D5	716.00	5.73 (145.6)	5.25 (133.4)	5.66 (143.8)	11.0
1000	630	9070TF1000D5	869.00	5.73 (145.6)	5.25 (133.4)	6.04 (153.4)	20.6
1500	1000	9070TF1500D5	1221.00	7.46 (189.5)	7.06 (179.3)	5.81 (147.6)	34.0
2000	1500	9070TF2000D5	1409.00	7.46 (189.5)	7.06 (179.3)	7.04 (178.8)	47.0



Model 450R



Model 460R  
Model 470R

**Voltage Transformers**

- These voltage transformers are designed for line-to-line or line-to-ground connection on the primary voltage indicated. See the table below to determine the applicable configuration for proper system voltage indication.
- Model 450R is designed for switchboard use. This model features high accuracy and burden capacity for excellent performance in metering and indication.
- Model 460R is a compact, lightweight design, providing exceptional performance in indicating applications.
- Model 470R is a compact, low cost design optimized for maximum accuracy and performance when used with Powerlogic® circuit monitors.

**Table 6.13: Voltage Transformers, UR/cUR Recognized. 60 Hz**

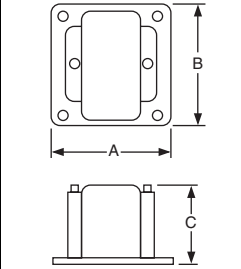
MODEL 450R Thermal Rating: 500 VA @ 30 °C; 300 VA @ 55 °C. Accuracy 0.3W, X.M & Y: 1.2 Z		MODEL 460R Thermal Rating: 150 VA @ 30 °C; 100 VA @ 55 °C. Accuracy 0.6W: 1.2 X		MODEL 470R Thermal Rating: 150 VA @ 30 °C; 100 VA @ 55 °C. Accuracy 0.3W: 1.2 X		System Voltage	Winding Ratio
Catalog Number	\$ Price Each	Catalog Number	\$ Price Each	Catalog Number	\$ Price Each		
450R069	1097.00	460R069	759.00	470R069	558.00	69/120Y	0.58:1
450R120	1053.00	460R120	786.00	470R120	578.00	120/208Y	1:1
450R208	1053.00	460R208	786.00	470R208	578.00	120/208Y	1.73:1
450R240	1053.00	460R240	786.00	470R240	578.00	240/416Y	2:1
450R288	1053.00	460R288	786.00	470R288	578.00	288/500Y	2.4:1
450R300	1097.00	460R300	810.00	470R300	596.00	300/520Y	2.5:1
450R380	1398.00	460R380	861.00	470R380	635.00	220/380Y	3.17:1
450R480	1097.00	460R480	810.00	470R480	596.00	480/480Y	4:1
450R600	1097.00	460R600	810.00	470R600	596.00	600/600Y	5:1

**Current Transformers**

**Table 6.14: General Purpose Compact Units, UR/cUR Recognized**

Window Size (inches)	Catalog Number (without brackets) ▲	Current Rating (Amperes)	VA 60 Hz	VA 400 Hz	Accuracy (At Rated Current)	Rating Factor 30 °C Ambient	\$ Price Each
1-1/8	2NR500	50:5	1.0	2.0	= 2%	1.0	96.00
	2NR600	60:5	1.0	2.0	= 2%	1.0	96.00
	2NR750	75:5	1.5	3.0	= 2%	1.0	96.00
	2NR800	80:5	1.5	3.0	= 2%	1.0	96.00
	2NR101	100:5	2.0	4.0	= 1%	1.0	96.00
	2NR121	120:5	2.5	5.0	= 1%	1.0	96.00
	2NR1250	125:5	2.5	5.0	= 1%	1.0	96.00
	2NR151	150:5	2.5	5.0	= 1%	1.0	96.00
	2NR201	200:5	2.5	5.0	= 1%	1.0	96.00
	2NR251	250:5	2.5	5.0	= 1%	1.0	96.00
	2NR301	300:5	2.5	5.0	= 1%	1.0	96.00
	1-9/16	5NR101	100:5	2.0	4.0	= 1%	1.0
5NR151		150:5	2.5	5.0	= 1%	1.0	114.00
5NR201		200:5	5.0	12.5	= 1%	1.0	114.00
5NR251		250:5	5.0	12.5	= 1%	1.0	114.00
5NR301		300:5	5.0	12.5	= 1%	1.0	114.00
5NR401		400:5	12.5	25.0	= 1%	1.0	123.00
5NR501		500:5	12.5	25.0	= 1%	1.0	123.00
5NR601		600:5	25.0	50.0	= 1%	1.0	123.00
1-9/16	54R101	100:5	2.0	4.0	= 1%	1.0	120.00
	54R151	150:5	2.5	5.0	= 1%	1.0	120.00
	54R201	200:5	5.0	12.5	= 1%	1.0	120.00
	54R251	250:5	5.0	12.5	= 1%	1.0	120.00
	54R301	300:5	5.0	12.5	= 1%	1.0	120.00
	54R401	400:5	12.5	25.0	= 1%	1.0	134.00
	54R501	500:5	12.5	25.0	= 1%	1.0	134.00
	54R601	600:5	25.0	50.0	= 1%	1.0	134.00
2-1/4	7RL500	50:5	2.5	5.0	= 1%	1.5	137.00
	7RL101	100:5	2.5	5.0	= 1%	1.5	137.00
	7RL151	150:5	2.5	5.0	= 1%	1.5	137.00
	7RL201	200:5	5.0	10.0	= 1%	1.5	137.00
	7RL251	250:5	5.0	10.0	= 1%	1.5	137.00
	7RL301	300:5	5.0	10.0	= 1%	1.5	137.00
	7RL401	400:5	12.5	25.0	= 1%	1.5	137.00
	7RL501	500:5	12.5	25.0	= 1%	1.5	137.00
	7RL601	600:5	12.5	25.0	= 1%	1.5	137.00
	7RL751	750:5	12.5	25.0	= 1%	1.5	137.00
	7RL801	800:5	12.5	25.0	= 1%	1.5	137.00
	7RL102	1000:5	25.0	50.0	= 1%	1.5	158.00
	7RL122	1200:5	25.0	50.0	= 1%	1.5	158.00
	7RL152	1500:5	25.0	50.0	= 1%	1.5	158.00

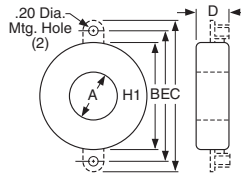
- ▲ Mounting brackets on 6-12.
- Use on 277/480 Wye systems
- ◆ Use on 480 V Delta systems
- ★ Designed for 50 Hz applications



Model	Dimensions (inches)		
	A	B	C
450R	6	7-1/8	5-7/8
460R	4-3/4	4-1/2	3-7/8
470R	4-3/4	4-1/2	3-7/8



Model 54R



Model	Dimensions (inches)				
	A	B	C	D	E
2NR	1.13	2.38	—	.94	—
5NR	1.56	3.50	—	1.06	—
54R	1.56	3.50	4.56	1.06	4.00
7RL	2.25	4.38	—	1.38	—

6 TRANSFORMERS





Torroidal Current Transformers

Table 6.17: Dimensions  
Models 152R, 170R, 180R, 210R

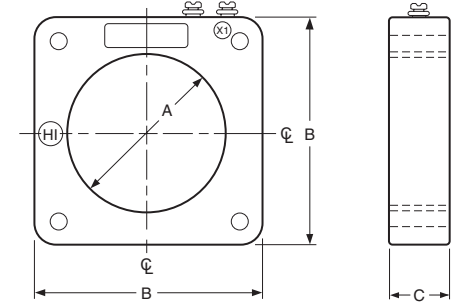


Table with 4 columns: Model, Dimensions (inches) A, B, C. Rows include models 152R, 170R, 180R, 210R and their corresponding dimensions.

Models 200R, 201R, 202R, 203R

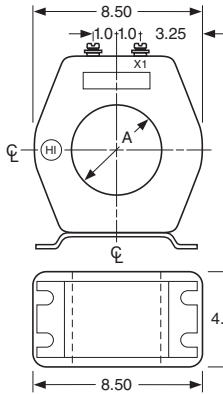


Table with 2 columns: Model, Dimension A (Inches). Rows include models 200R, 201R, 202R, 203R and their dimension A values.

Shorting Terminal Blocks

Table with 3 columns: Catalog No., Description, \$ Price. Rows include models 3090TB4 and 3090TB6 with their descriptions and prices.

▲ Mounting brackets on 6-12  
■ Base is included

Table 6.18: Torroidal Current Transformers, UR/cUR Recognized, 25-400 Hz

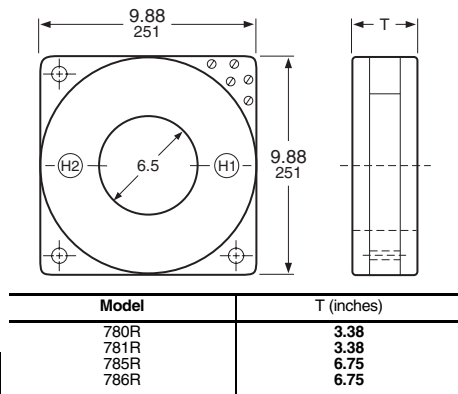
Main product table with columns for Window Size (inches), Catalog Number, Current Rating (Amperes), Relay Class, ANSI Accuracy Classification (B-0.1, B-0.2, B-0.5, B-0.9, B-1.8), Rating Factor (30°C Ambient), and \$ Price. Rows list various transformer models and their specifications.

6 TRANSFORMERS

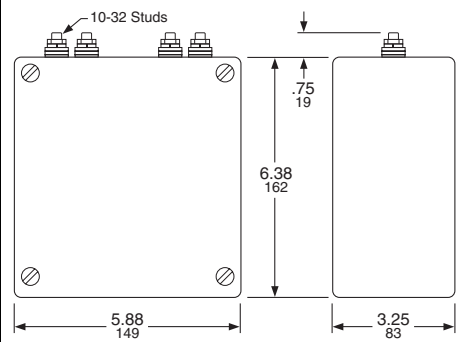


**Bushing Current Transformers 50–400 Hz**

**Table 6.23: Dimensions**  
Models 780R, 781R, 785R, 786R



**Model 81X**



**Table 6.24: Mounting Brackets**

Model	Bracket	\$ Price
2NR	MB1	9.00
5NR	MB1	9.00
7RL	MB7	11.70
54R	Included	—
64R	MB10	9.00
66R	MB12	13.10
74R	MB16	13.10
76R	MB18	13.10
81X	MB81	27.20
100R	MB31	27.20
110R	MB32	27.20
120R	MB31	27.20
140R	MB32	27.20
151R	MB30	27.20
152R	MB30	27.20
170R	MB30	27.20
180R	MB9	16.40
200R	Included	—
201R	Included	—
202R	Included	—
203R	Included	—
210R	MB32	27.20
260R	Not Available	—
270R	Not Available	—
273	Not Available	—

**Table 6.25: Bushing Current Transformers**

Window Size (inches)	Catalog Number	Current ▲ Rating (Amperes)	Relay Class	ANSI Accuracy Classification—60 Hz Metering Class					Rating Factor 30°C Ambient	\$ Price
				B-0.1	B-0.2	B-0.5	B-0.9	B-1.8		
6-1/2	780R500	50:5	—	—	—	—	—	—	2.0	723.00
	780R750	75:5	C10	1.2	2.4	—	—	—	2.0	723.00
	780R101	100:5	C10	2.4	2.4	—	—	—	2.0	723.00
	780R151	150:5	C20	0.6	1.2	—	—	—	2.0	723.00
	780R201	200:5	C20	0.6	1.2	2.4	—	—	2.0	723.00
	780R251	250:5	C20	0.6	0.6	1.2	2.4	—	2.0	723.00
	780R301	300:5	C50	0.3	0.6	1.2	1.2	2.4	2.0	723.00
	780R401	400:5	C50	0.3	0.3	0.6	1.2	1.2	2.0	723.00
	780R501	500:5	C50	0.3	0.3	0.6	0.6	1.2	2.0	723.00
	780R601	600:5	C100	0.3	0.3	0.3	0.6	0.6	2.0	723.00
	780R751	750:5	C100	0.3	0.3	0.3	0.3	0.6	2.0	780.00
	780R801	800:5	C100	0.3	0.3	0.3	0.3	0.6	2.0	780.00
	780R102	1000:5	C100	0.3	0.3	0.3	0.3	0.3	2.0	780.00
	780R122	1200:5	C200	0.3	0.3	0.3	0.3	0.3	2.0	780.00
	780R152	1500:5	C200	0.3	0.3	0.3	0.3	0.3	2.0	780.00
	780R162	1600:5	C200	0.3	0.3	0.3	0.3	0.3	2.0	813.00
	780R202	2000:5	C200	0.3	0.3	0.3	0.3	0.3	2.0	813.00
	780R252	2500:5	C200	0.3	0.3	0.3	0.3	0.3	2.0	813.00
780R302	3000:5	C200	0.3	0.3	0.3	0.3	0.3	2.0	813.00	
780R402	4000:5	C200	0.3	0.3	0.3	0.3	0.3	1.5	867.00	
6-1/2	781R601	600:5 MR	C100	0.3	0.3	0.3	0.6	0.6	2.0	972.00
	781R122	1200:5 MR	C200	0.3	0.3	0.3	0.3	0.3	2.0	1023.00
	781R202	2000:5 MR	C200	0.3	0.3	0.3	0.3	0.3	2.0	1064.00
	781R302	3000:5 MR	C200	0.3	0.3	0.3	0.3	0.3	2.0	1083.00
	781R402	4000:5 MR	C200	0.3	0.3	0.3	0.3	0.3	1.5	1118.00
	6-1/2	785R500	50:5	C10	2.4	2.4	—	—	—	2.0
785R750		75:5	C20	1.2	1.2	—	—	—	2.0	1317.00
785R101		100:5	C20	1.2	1.2	2.4	—	—	2.0	1317.00
785R151		150:5	C50	0.6	0.6	1.2	2.4	—	2.0	1317.00
785R201		200:5	C50	0.6	0.6	1.2	2.4	2.4	2.0	1317.00
785R251		250:5	C50	0.3	0.6	1.2	1.2	2.4	2.0	1317.00
785R301		300:5	C100	0.3	0.3	0.6	0.6	1.2	2.0	1317.00
785R401		400:5	C100	0.3	0.3	0.3	0.6	1.2	2.0	1317.00
785R501		500:5	C100	0.3	0.3	0.3	0.6	0.6	2.0	1317.00
785R601		600:5	C200	0.3	0.3	0.3	0.3	0.6	2.0	1317.00
785R751		750:5	C200	0.3	0.3	0.3	0.3	0.3	2.0	1317.00
785R801		800:5	C200	0.3	0.3	0.3	0.3	0.3	2.0	1415.00
785R102		1000:5	C200	0.3	0.3	0.3	0.3	0.3	2.0	1415.00
785R122		1200:5	C400	0.3	0.3	0.3	0.3	0.3	2.0	1415.00
785R152		1500:5	C400	0.3	0.3	0.3	0.3	0.3	2.0	1415.00
785R162		1600:5	C400	0.3	0.3	0.3	0.3	0.3	2.0	1479.00
785R202		2000:5	C400	0.3	0.3	0.3	0.3	0.3	2.0	1479.00
785R252		2500:5	C400	0.3	0.3	0.3	0.3	0.3	2.0	1479.00
785R302	3000:5	C400	0.3	0.3	0.3	0.3	0.3	2.0	1479.00	
785R402	4000:5	C400	0.3	0.3	0.3	0.3	0.3	1.5	1577.00	
6-1/2	786R601	600:5 MR	C200	0.3	0.3	0.3	0.3	0.3	2.0	1566.00
	786R122	1200:5 MR	C400	0.3	0.3	0.3	0.3	0.3	2.0	1664.00
	786R202	2000:5 MR	C400	0.3	0.3	0.3	0.3	0.3	2.0	1722.00
	786R302	3000:5 MR	C400	0.3	0.3	0.3	0.3	0.3	2.0	1749.00
	786R402	4000:5 MR	C400	0.3	0.3	0.3	0.3	0.3	1.5	1823.00

▲ See chart on 6-11 for multi-ratio (MR) taps.

**Auxiliary Current Transformers**

**Table 6.26: Auxiliary Current Transformers**

Catalog Number (without brackets)	Ratio	\$ Price
81X05000100	5:1	990.00
81X05000200	5:2	990.00
81X05000250	5:2.5	990.00
81X05000500	5:5	990.00
81X07500500	7.5:5	990.00
81X10000500	10:5	990.00
81X12500500	12.5:5	990.00
81X15000500	15:5	990.00

NOTE: Model 81X Accuracy 0.3B0.1, B0.2, B0.5@60 Hz, RF=1.5@30 °C

07 International Load Centers

**Circuit Breaker Load Centers**

**International Miniature Circuit Breakers**

QO® Plug-On and Bolt-On Circuit Breakers and Switches 7-2

Plug-On QOXD and Bolt-On QOBXD 7-3

**Load Centers**

IEC Certified QO® Load Centers, Type 1 (Indoor) 7-4



by Schneider Electric

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### General Description

In 1955 Square D Company introduced the QO Plug-on System and revolutionized the way electrical contractors install miniature circuit breakers in the United States. Today as part of Schneider Electric we offer the same Plug-on System technology around the world. IEC certified QO products are available for residential, commercial and industrial applications.

**Table 7.1: International Miniature Circuit Breaker Description**

Circuit Breaker	Description	1Ø Consumer Units	3Ø Distribution Boards
QOXD	Branch circuit breaker	X	X

### Characteristics

- Circuit breakers are rated 240 Vac single phase and 415 Vac three phase, 50/60 Hz.
- Circuit breakers are available in 1-, 2- or 3-pole construction.
- Thermal trip elements are factory calibrated to 40°C (IEC 947-2) and 30°C (IEC 898) ambient temperature.
- Trip-free handle ensures tripping even when the circuit breaker is held or locked in the ON position.
- Circuit breakers are in compliance with international standards set by the International Electrotechnical Commission (IEC).
- The CE marking is located on each circuit breaker in accordance with the low voltage directive of the European Union.
- The entire QO circuit breaker family provides the advantage of a plug-on connection. (Bolt-on connections also available)

### Accessories

**Table 7.2: Accessories**

Accessory	Description	Cat. No.	QOXD
Handle Tie	Ties two 1P circuit breakers together	QO1HT	X
Handle Lock-Off (Clamp)	Attaches to 1P circuit breaker handles	QO1LO	X
	Attaches to 1P, 2P, 3P circuit breaker handles	HLO1	X
	Attaches to 1P, 2P, 3P circuit breaker handles	QOEPLA	—
Handle Padlock Attachment	Attaches to 1P circuit breaker handles	QOE1PL	—
	Attaches to 1P circuit breaker escutcheon (fixed)	QO1PA	X
	Attaches to 1P circuit breaker handles (removable)	QOHPL	X
	Attaches to 2P, 3P circuit breaker handles (removable)	QO1HPL	X
	Attaches to 2P circuit breaker handles (removable)	GF12PA	—

### Circuit Breaker Operating Characteristics

**Table 7.3: Branch Circuit Breakers**

Cat. No. Prefix		Number of Poles	Continuous Ampere Rating	IEC 898 Service Rating $I_{cn}$		Tripping Characteristics
Plug-on	Bolt-on			240 V	415 V	
QOXD	QOBXD	1, 2, 3	10–32 A	3000	3000	Type D (10–20 $I_n$ )
Cat. No. Prefix		Number of Poles	Continuous Ampere Rating	IEC 947-2 Service Rating $I_{cu}$ ( $I_{cs}$ )		Tripping Characteristics
Plug-on	Bolt-on			240 V	415 V	
QOXD	QOBXD	1, 2, 3	10–32 A	3000 (100%)	3000 (100%)	—
		1	40–63 A	3000 (50%)	—	—
		2, 3	40–100 A	—	3000 (50%)	—

### Main Switches

**Table 7.4: QO-M Plug-On Main Incomer Switch  
240 V Certified to IEC 947-3**

Ampere Rating	1P		2P		3P and 4P	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
100 A	N/A	—	N/A	—	N/A	—
125 A	N/A	—	N/A	—	QO3100M	116.00
125 A–4P	N/A	—	N/A	—	QO4100M	200.00

**Table 7.5: QOXD Thermal-Magnetic, Plug-On Miniature Circuit Breakers**  
240/415 V 10–32 A Certified to IEC 898 @ 3 kA, 40–100 A Certified to IEC 947-2 @ 3 kA

Ampere Rating	1P		2P		3P		Terminal Capacity Range
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	
10 A	QOXD110	20.40	QOXD210	46.90	QOXD310	165.00	2.5-6 mm <sup>2</sup>
16 A	QOXD116	20.40	QOXD216	46.90	QOXD316	165.00	2.5-6 mm <sup>2</sup>
20 A	QOXD120	20.40	QOXD220	46.90	QOXD320	165.00	2.5-6 mm <sup>2</sup>
25 A	QOXD125	20.40	QOXD225	46.90	QOXD325	165.00	2.5-6 mm <sup>2</sup>
32 A	QOXD132	20.40	QOXD232	46.90	QOXD332	165.00	2.5-6 mm <sup>2</sup>
40 A	QOXD140	20.40	QOXD240	46.90	QOXD340	165.00	10-25 mm <sup>2</sup>
45 A	QOXD145	20.40	QOXD245	46.90	QOXD345	165.00	10-25 mm <sup>2</sup>
50 A	QOXD150	20.40	QOXD250	46.90	QOXD350	165.00	10-25 mm <sup>2</sup>
63 A	QOXD163	20.40	QOXD263	46.90	QOXD363	165.00	10-25 mm <sup>2</sup>
80 A	N/A	—	QOXD280	132.00	QOXD380	244.00	25-50 mm <sup>2</sup>
100 A	N/A	—	QOXD2100	132.00	QOXD3100	244.00	25-50 mm <sup>2</sup>

**Table 7.6: QOBXD Thermal-Magnetic, Bolt-On Miniature Circuit Breakers**  
240/415 V 10–32 A Certified to IEC 898 @ 3 kA, 40–100 A Certified to IEC 947-2 @ 3 kA

Ampere Rating	1P		2P		3P		Terminal Capacity Range
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	
10 A	QOBXD110	26.50	QOBXD210	59.00	QOBXD310	195.00	2.5-6 mm <sup>2</sup>
16 A	QOBXD116	26.50	QOBXD216	59.00	QOBXD316	195.00	2.5-6 mm <sup>2</sup>
20 A	QOBXD120	26.50	QOBXD220	59.00	QOBXD320	195.00	2.5-6 mm <sup>2</sup>
25 A	QOBXD125	26.50	QOBXD225	59.00	QOBXD325	195.00	2.5-6 mm <sup>2</sup>
32 A	QOBXD132	26.50	QOBXD232	59.00	QOBXD332	195.00	2.5-6 mm <sup>2</sup>
40 A	QOBXD140	26.50	QOBXD240	59.00	QOBXD340	195.00	10-25 mm <sup>2</sup>
45 A	QOBXD145	26.50	QOBXD245	59.00	QOBXD345	195.00	10-25 mm <sup>2</sup>
50 A	QOBXD150	26.50	QOBXD250	59.00	QOBXD350	195.00	10-25 mm <sup>2</sup>
63 A	QOBXD163	26.50	QOBXD263	59.00	QOBXD363	195.00	10-25 mm <sup>2</sup>
80 A	N/A	—	QOBXD280	160.00	QOBXD380	279.00	25-50 mm <sup>2</sup>
100 A	N/A	—	QOBXD2100	160.00	QOBXD3100	279.00	25-50 mm <sup>2</sup>

Short circuit ratings ..... Page 7-2  
Accessories ..... Page 7-2

**Application Data**

QO 3 Phase Circuit Breaker Load Centers from Square D can be certified to IEC 60439-1 and 60439-3. Contact your local Square D Field Sales office for more information. They are designed to meet residential, commercial, and industrial requirements to protect electrical systems and equipment.

**Features**

- Three phase construction
- 100, 125, 150, 200 and 225 A mains ratings with main lugs, main circuit breaker, and main switch ratings
- 9-42 circuit indoor version
- Flush or surface mounting
- Straight-in wiring to minimize service cable installation
- Top or bottom feed
- Automatic flush adjustment cover to speed installation
- Covers sold separately
- Products are stocked in USA
- Bus on 12-60 circuit load centers is one piece, solid copper
- Order entry point is Lexington
- For more information, contact your local Field Sales office.

**Table 7.7: Load Centers**

Mains Rating Ampere	Spaces/ Max. Poles	Type 1			
		Box and Interior		Cover With Door	
		Cat. No.	\$ Price	Cat. No.▲	\$ Price
<b>Main Lugs 240/415 Vac 3Ø4W</b>					
125 A	12	QO312L125G	221.00	QOC16UF/S■	25.10
	20	QO320L125G	314.00	QOC24UF/S■	25.10
	24	QO324L125G	360.00	QOC24UF/S■	25.10
200	18	QO318L200G	295.00	QOC30UF/S■	58.00
	30	QO330L200G	413.00	QOC30UF/S■	58.00
225	42	QO342L225G	561.00	QOC42UF/S■	74.00
<b>Main Circuit Breaker 240/415 Vac 3Ø4W</b>					
125	30	QO330MQ125	1226.00	QOC342MQF/S	61.00
150	30	QO330MQ150	1226.00	QOC342MQF/S	61.00
	42	QO342MQ150	1351.00	QOC342MQF/S	61.00
200	30	QO330MQ200	1226.00	QOC342MQF/S	61.00
	42	QO342MQ200	1351.00	QOC342MQF/S	61.00
225	42	QO342MQ225	1351.00	QOC342MQF/S	61.00

▲ F/S at end of catalog number indicates to order F for flush device or S for surface device.  
■ Discount Schedule DE3A



# Section 8

## 08 International Safety Switches

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<b>General Duty Safety Switches</b>	
CSA Certified General Duty—Fusible 240 Vac	8-2
<b>Heavy Duty Safety Switches</b>	
CSA Certified Heavy Duty—Fusible 240 Vac	8-3
CSA Certified Heavy Duty—Fusible 600 Vac	8-3
CSA Certified Heavy Duty—Non-Fusible 600 Vac	8-4
CSA Certified Heavy Duty—Special Applications	8-4
<b>Double-Throw Safety Switches</b>	
CSA Certified Double-Throw	8-5
<b>Accessories</b>	
CSA Certified Switch Accessories	8-6

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**CSA Certified General Duty—Fusible 240 Vac**

- Switches have factory-installed ground bars.
- Optional accessories are listed on page 8-6.
- Products are not stocked in the USA.
- Order entry point is Lexington.

**Table 8.1: General Duty Single-Throw 120/240 Vac (Plug); 240 Vac (Cartridge)**

Ampere	Fuse	Type 1		Type 3R		Field Installable Class R Fuse Kits ♦	
		Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
<b>2-Pole + S/N (2 Blades and Fuseholders, 1 S/N)—Suitable For Service Entrance Use</b>							
30 A	Plug	CD211N▲	104.00	—	—	—	—
30 A	Cartridge	CD221N▲	137.00	—	—	DRK30	25.70
60 A	—	CD222N	221.00	CD222NRB	339.00	RFK03H	25.50
100 A	—	CD223N	485.00	CD223NRB	543.00	RFK10■	47.70
200 A	—	CD224N	947.00	CD224NRB	1200.00	HRK1020	47.70
400 A	—	CD225N	2610.00	CD225NR	—	DRK40	111.00
600 A	—	CD226N	5166.00	CD226NR	—	DRK600	111.00
<b>3-Pole + S/N (3 Blades and Fuseholders, 1 S/N)—Suitable For Service Entrance Use</b>							
30 A	Cartridge	CD321N▲	146.00	CD321NRB	494.00	DRK30	25.70
60 A	—	CD322N	366.00	CD322NRB	743.00	RFK03H	25.50
100 A	—	CD323N	485.00	CD323NRB	1371.00	RFK10■	47.70
200 A	—	CD324N	2019.00	CD324NRB	2454.00	HRK1020	47.70
400 A	—	CD325N	3113.00	CD325NR	—	DRK40	111.00
600 A	—	CD326N	5823.00	CD326NR	—	DRK600	111.00

- ▲ Not suitable for use as service entrance equipment.
- F Series only
- ♦ Stock

**Table 8.2: Light Duty Single-Throw 120 Vac Plug**

Ampere	Fuse	Type 1	
		Cat. No.	\$ Price
30 A	Plug	L111N★	54.00

- ★ Not suitable for use as service equipment.

**CSA Certified Heavy Duty—Fusible 240 Vac**

- Switches have factory-installed ground bars.
- Switches 30 A–200 A Type 4/4X and 12 have viewing windows.
- Optional accessories are listed on page 8-6.
- Products are not stocked in the USA.
- Order entry point is Lexington.

**Table 8.3: Single-Throw 240 Vac, 250 Vdc**

Ampere	Type 1		Type 3R		Type 4/4X		Type 12	
	Cat. No.	Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
<b>2P + S/N (2 Blades and Fuseholders, 1 S/N)—Suitable For Service Entrance Use</b>								
30 A	CH221N	251.00	CH221NRB	480.00	Use 3P devices listed below.		CH221NAWK	620.00
60 A	CH222N	504.00	CH222NRB	893.00			CH222NAWK	791.00
100 A	CH223N	807.00	CH223NRB	1196.00			CH223NAWK	1250.00
200 A	CH224N	1409.00	CH224NRB	1695.00			CH224NAWK	1964.00
400 A	CH225N	3246.00	CH225NR	4568.00			CH225NAWK	4409.00
600 A	CH226N	6219.00	CH226NR	8061.00			CH226NAWK	6936.00
800 A	H227N▲	10067.00	H227NR▲	12216.00	—	—	H227NAWK▲	12338.00
1200 A	H228N▲	12422.00	H228NR▲	16665.00	—	—	H228NAWK▲	17184.00
<b>3P + S/N (3 Blades and Fuseholders, 1 S/N)—Suitable For Service Entrance Use</b>								
30 A	CH321N	339.00	CH321NRB	596.00	CH321NDS	2201.00	CH321NAWK	750.00
60 A	CH322N	569.00	CH322NRB	947.00	CH322NDS	2687.00	CH322NAWK	1007.00
100 A	CH323N	941.00	CH323NRB	1398.00	CH323NDS	5651.00	CH323NAWK	1625.00
200 A	CH324N	1580.00	CH324NRB	1896.00	CH324NDS	7836.00	CH324NAWK	2249.00
400 A	CH325N	3977.00	CH325NR	4650.00	CH325NDS	15321.00	CH325NAWK	4737.00
600 A	CH326N	6845.00	CH326NR	9164.00	CH326NDS	21759.00	CH326NAWK	7863.00
800 A	H327N▲	12189.00	H327NR▲	15563.00	—	—	H327NAWK▲	15879.00
1200 A	H328N▲	15314.00	H328NR▲	19709.00	—	—	H328NAWK▲	20015.00

▲ Dual UL Listed and CSA Certified device.

**CSA Certified Heavy Duty—Fusible 600 Vac**

- Switches have factory-installed ground bars.
- Switches 30 A–200 A Type 4/4X and 12 have viewing windows.
- Optional accessories are listed on page 8-6.
- Products are not stocked in the USA.
- Order entry point is Lexington .

**Table 8.4: Single-Throw 600 Vac, 600 Vdc**

Ampere	Type 1		Type 3R		Type 4/4X		Type 12	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
<b>3-Pole (3 Blades and Fuseholders)</b>								
30 A	CH361	379.00	CH361RB	636.00	CH361DS	1714.00	CH361AWK	667.00
60 A	CH362	453.00	CH362RB	744.00	CH362DS	1881.00	CH362AWK	686.00
100 A	CH363	868.00	CH363RB	1191.00	CH363DS	3729.00	CH363AWK	1079.00
200 A	CH364	1233.00	CH364RB	1620.00	CH364DS	5184.00	CH364AWK	1649.00
400 A	CH365	3186.00	CH365R	3872.00	CH365DS	10214.00	CH365AWK	3641.00
600 A	CH366	5354.00	CH366R	7703.00	CH366DS	14601.00	CH366AWK	6135.00
800 A	H367▲	8879.00	H367R▲	11000.00	—	—	H367AWK▲	10901.00
1200 A	H368▲	11671.00	H368R▲	13339.00	—	—	H368AWK▲	13137.00
<b>3-Pole + S/N (3 Blades and Fuseholders, 1 S/N)—Suitable For Service Entrance Use</b>								
30 A	For 3 pole switches 30 A–1200 A with solid neutral attachment, select switch from 3-Pole table above and add the Solid Neutral Assembly Kit from the Accessories 8-6.							
60 A								
100 A								
200 A								
400 A								
600 A								
800 A								
1200 A								
<b>4-Pole (4 Blades and Fuseholders)—Not Suitable For Service Entrance Use</b>								
30 A	H461▲	609.00	—	—	—	—	H461AWK▲	743.00
60 A	H462▲	710.00	—	—	—	—	H462AWK▲	838.00
100 A	H463▲	1185.00	—	—	—	—	H463AWK▲	1288.00
200 A	H464▲	2008.00	—	—	—	—	H464AWK▲	2218.00
400 A	CH465	4140.00	—	—	—	—	CH465AWK	4538.00
600 A	CH466	6736.00	—	—	—	—	—	—

▲ Dual UL Listed and CSA Certified device.

**CSA Certified Heavy Duty—Non-Fusible 600 Vac**

- Switches have factory-installed ground bars.
- Switches 30 A–200 A Type 4/4X and 12 have viewing windows.
- Optional accessories are listed on page 8-6.
- Products are not stocked in the USA.
- Order entry point is Lexington.

**Table 8.5: Single-Throw 600 Vac, 600 Vdc**

Ampere	Type 1		Type 3R		Type 4/4X		Type 7/9		Type 3R/12	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
<b>3P</b>										
30 A	CHU361	305.00	CHU361RB	530.00	CHU361DS	2184.00	—	—	CHU361AWK	692.00
60 A	CHU362	530.00	CHU362RB	932.00	CHU362DS	2568.00	H60XFA▲	2571.00	CHU362AWK	873.00
100 A	CHU363	878.00	CHU363RB	1343.00	CHU363DS	5199.00	H100XFA▲	3045.00	CHU363AWK	1281.00
200 A	CHU364	1325.00	CHU364RB	1616.00	CHU364DS	7055.00	H225XKA▲	6387.00	CHU364AWK	1686.00
400 A	CHU365	3054.00	CHU365RB	6216.00	CHU365DS	14397.00	—	—	CHU365AWK	4127.00
600 A	CHU366	5352.00	CHU366R	8180.00	CHU366DS	19358.00	—	—	CHU366AWK	6816.00
800 A	HU367▲	9978.00	HU367R▲	13050.00	—	—	—	—	HU367AWK▲	13097.00
1200 A	HU368▲	13421.00	HU368R▲	17867.00	—	—	—	—	HU368AWK▲	17940.00
<b>4P, 600 Vac, 600 Vdc</b>										
30 A	HU461▲■	827.00	—	—	—	—	—	—	HU461AWK▲■	915.00
60 A	HU462▲■	914.00	—	—	—	—	—	—	HU462AWK▲■	1008.00
100 A	HU463▲■	1647.00	—	—	—	—	—	—	HU463AWK▲■	1791.00
200 A	HU464▲	2454.00	—	—	—	—	—	—	HU464AWK	2937.00
400 A	CHU465	5201.00	—	—	—	—	—	—	CHU465AWK	5775.00
600 A	CHU466	9072.00	—	—	—	—	—	—	CHU466AWK	—
<b>6P, 600 Vac</b>										
30 A	—	—	—	—	—	—	—	—	HU661AWK▲	3357.00
60 A	—	—	—	—	—	—	—	—	HU662AWK▲	3884.00
100 A	—	—	—	—	—	—	—	—	HU663AWK▲	4793.00
200 A	—	—	—	—	—	—	—	—	HU664AWK	10571.00

- ▲ Dual UL Listed and CSA Certified devices.
- F Series devices.

**CSA Certified Heavy Duty—Special Applications**

- Switches have factory-installed ground bars.
- Optional accessories are listed on page 8-6.
- Products are not stocked in the USA.
- Order entry point is Lexington.

**Table 8.6: Krydon® Enclosures—Single-Throw 600 Vac, 600 Vdc**

Amperes	Type 4X	
	Cat. No.	\$ Price
<b>3P Fusible</b>		
30 A	H361DF■▲	3570.00
60 A	H362DF■▲	3968.00
100 A	H363DF■▲	7613.00
200 A	H364DF■	9729.00
<b>3P Non-Fusible</b>		
30 A	HU361DF■▲	3402.00
60 A	HU362DF■▲	3782.00
100 A	HU363DF■▲	7241.00
200 A	HU364DF■	9695.00

- ▲ F Series devices.
- Dual UL Listed and CSA Listed device.

**Table 8.7: Receptacle Switches—Single-Throw 600 Vac**

Ampere	Stainless Steel Type 4/4X		Use With Plug		Type 12	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
<b>3P Fusible</b>						
30 A	CH361DSWC	4322.00	APJ3485	1235.00	CH361AWC	2243.00
60 A	CH362DSWC	4581.00	APJ6485	1295.00	CH362AWC	2459.00
100 A	CH363DSWC	8309.00	APJ10487	1928.00	CH363AWC	3689.00
<b>3P Non-Fusible</b>						
30 A	CHU361DSWC	3927.00	APJ3485	1235.00	CHU361AWC	2058.00
60 A	CHU362DSWC	4325.00	APJ6485	1295.00	CHU362AWC	2310.00
100 A	CHU363DSWC	7863.00	APJ10487	1928.00	CHU363AWC	3282.00

**CSA Certified Double-Throw**

- Switches have factory-installed ground bars.
- Optional accessories are listed on page 8-6.
- Products are not stocked in the USA.
- Order entry point is Lexington..

**Table 8.8: Double-Throw**

Ampere	Type 1		Type 3R		Type 4/4X		Type 12	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
<b>2P 240 Vac—250 Vdc</b>								
30 A	C92251	615.00	—	—	—	—	—	—
60 A	For 2P switch applications, select 3P switch 60 A–600 A from 3P table below.							
100 A								
200 A								
400 A								
<b>3P 600 Vac—250 Vdc</b>								
30 A	C92351▲	716.00	—	—	—	—	—	—
60 A	For 60–100 A, use US devices.							
100 A								
200 A	C82344■	2813.00	C82344RB■	5898.00	C82344DS■	11444.00	CH82344■	7532.00
<b>4P 600 Vac</b>								
30 A	C92451▲	981.00	—	—	—	—	—	—
60 A	For 60–100 A, use US devices.							
100 A								

▲ 240 Vac Maximum  
■ For isolation only, not Load-Make/Load-Break.

**CSA Certified Switch Accessories**

- Optional
- Order entry point is Lexington for non-stock items.

**Table 8.9: Electrical Interlock Kits**

Ampere	Single-Throw		Double-Throw Type 1 Only	
	Cat. No.	\$ Price	Cat. No.	\$ Price
30-100 A	EIK-1 or -2	311.00	EIK-1 or -2▲	311.00
200 A-3P	EIK-1 or -2■	311.00	EK200DTU2	389.00
200 A-4P	EIK-1 or -2■	311.00	EK100DTU2	389.00
400 A	EIK4060-1 or -2	533.00	EK400DTU2	389.00
600 A	EIK4060-1 or -2	533.00	—	—
800 A	EIK4060-1 or -2	533.00	—	—
1200 A	EIK4060-1 or -2	533.00	—	—

- ▲ Not for C92251, C92351, C92451.
- E-series uses EK1020-1 or -2. Requires 2.

**Table 8.10: Fuse Puller Kits★**

Ampere	Cat. No.	\$ Price
30 A	FPK03	30.20
60 A	FPK0610	42.60
100 A	FPK0610	42.60

**Table 8.11: Class R Fuse Kits**

Voltage	Ampere	Cat. No.	\$ Price
240 Vac	30 A	RFK03L	25.50
	60 A	RFK03H	25.50
	100 A	RFK10	47.70
	200 A	HRK1020	47.70
	400 A	HRK4060	111.00
	600 A	HRK4060	111.00
600 Vac	30 A	RFK03H	25.50
	60 A	RFK06H	25.50
	100 A	RFK10	47.70
	200 A	HRK1020	47.70
	400 A	HRK4060	111.00
	600 A	HRK4060	111.00

**Table 8.12: Solid Neutral Assembly Kits★**

Ampere	Single-Throw Type 1, 3R		Single-Throw (Copper) Type 4, 4X		Double-Throw Type 1	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
30 A	CSN03	83.00	CSN03C	102.00	SN0310♦	114.00
60 A	CSN0610	107.00	CSN0610C	114.00	SN0310	114.00
100 A	CSN0610	107.00	CSN0610C	114.00	SN0310	114.00
200 A	CSN20	200.00	CSN20C	252.00	225SNA	198.00
400 A	CH600SN	327.00	CH600SNC	453.00	DT400N	458.00
600 A	CH600SN	327.00	CH600SNC	453.00	—	—
800 A	H800SNE4	753.00	—	—	—	—
1200 A	H1200SNE4	1034.00	—	—	—	—

- ♦ C92251, C92351, C92451 uses DT30SN.
- ★ Not Stocked—Order Only.

- Products are not stocked in the USA.
- Optional
- Order entry point is Lexington.

**Table 8.13: Hubs**

Size	Type 3R		Type 4/4X/12			
			Standard Zinc		Chrome Plated Zinc	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
0.50	—	—	H050	31.10	H050CP	40.70
0.75	B075	35.00	H075	45.00	H075CP	57.00
1.00	B100	35.00	H100	47.10	H100CP	65.00
1.25	B125	35.00	H125	54.00	H125CP	67.00
1.50	B150	35.00	H150	83.00	H150CP	96.00
2.00	B200	65.00	H200	120.00	H200CP	137.00
2.50	B250	107.00	H250	138.00	—	—
3.00	—	—	H300	177.00	—	—
CAP	BCAP	3.80	—	—	—	—

09 International Circuit Breakers

**Thermal-Magnetic Circuit Breakers**

F-, Q-, K-, L- and M-frame, IEC Rated 415/240 Vac Max. 9-2

**Electronic Trip Circuit Breakers**

P-frame, 3P, Micrologic® Electronic-trip, IEC Rated 9-3

R-frame, 3P, Micrologic Electronic-trip, IEC Rated 9-4

P-frame, 4P, Micrologic Electronic-trip, IEC Rated 9-5

R-frame, 4P, Micrologic Electronic-trip, IEC Rated 9-6

**Breaking Capacities** 9-7

**Circuit Breaker Dimensions** 9-8



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**Thermal-Magnetic  
Circuit Breakers**
**F-, Q-, K-, L- and M-frame, IEC Rated 415/240 Vac Max.**

Class 600

- CE marking.
- S-frame circuit breakers are CCC Certified.
- International products—for export use only.
- MCCBs in I-Line® plug-on construction and a complete line of accessories are available. Contact your local Field Sales office.
- Order entry point is Cedar Rapids, Iowa.

**Table 9.1: F-frame and Q-frame, Individually-Mounted, IEC Rated 415/240 Vac Max., 50/60 Hz, 1P, 2P, and 3P**

Ampere Rating	1P		2P		3P	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
<b>SFAL</b>						
16 A	SFAL1016	450.00	SFAL2016	704.00	SFAL3016	906.00
20 A	SFAL1020	450.00	SFAL2020	704.00	SFAL3020	906.00
32 A	SFAL1032	450.00	SFAL2032	704.00	SFAL3032	906.00
40 A	SFAL1040	450.00	SFAL2040	704.00	SFAL3040	906.00
50 A	SFAL1050	450.00	SFAL2050	704.00	SFAL3050	906.00
63 A	SFAL1063	450.00	SFAL2063	704.00	SFAL3063	906.00
80 A	SFAL1080	510.00	SFAL2080	890.00	SFAL3080	1115.00
100 A	SFAL1100	510.00	SFAL2100	890.00	SFAL3100	1115.00
125 A	—	—	SFAL2125	1076.00	SFAL3125	1262.00
160 A	—	—	SFAL2160	1259.00	SFAL3160	1449.00
<b>SFHL</b>						
16 A	—	—	SFHL2016	1163.00	SFHL3016	1355.00
20 A	—	—	SFHL2020	1163.00	SFHL3020	1355.00
32 A	—	—	SFHL2032	1163.00	SFHL3032	1355.00
40 A	—	—	SFHL2040	1163.00	SFHL3040	1355.00
50 A	—	—	SFHL2050	1163.00	SFHL3050	1355.00
63 A	—	—	SFHL2063	1163.00	SFHL3063	1355.00
80 A	—	—	SFHL2080	1353.00	SFHL3080	1541.00
100 A	—	—	SFHL2100	1353.00	SFHL3100	1541.00
<b>SFIL Current-limiting I-Limiter®</b>						
20 A	—	—	SFIL2020	3317.00	SFIL3020	3999.00
32 A	—	—	SFIL2032	3317.00	SFIL3032	3999.00
40 A	—	—	SFIL2040	3317.00	SFIL3040	3999.00
50 A	—	—	SFIL2050	3317.00	SFIL3050	3999.00
63 A	—	—	SFIL2063	3317.00	SFIL3063	3999.00
80 A	—	—	SFIL2080	3317.00	SFIL3080	3999.00
100 A	—	—	SFIL2100	3317.00	SFIL3100	3999.00
<b>PowerPact® Q-frame—250 A, Thermal-magnetic (415Y/240 Vac)▲</b>						
70 A	—	—	QBL22070	474.00	QBL32070	1248.00
80 A	—	—	QBL22080	474.00	QBL32080	1248.00
90 A	—	—	QBL22090	474.00	QBL32090	1248.00
100 A	—	—	QBL22100	474.00	QBL32100	1248.00
110 A	—	—	QBL22110	474.00	QBL32110	1248.00
125 A	—	—	QBL22125	474.00	QBL32125	1248.00
150 A	—	—	QBL22150	474.00	QBL32150	1248.00
175 A	—	—	QBL22175	474.00	QBL32175	1248.00
200 A	—	—	QBL22200	474.00	QBL32200	1248.00
225 A	—	—	QBL22225	474.00	QBL32225	1248.00
250 A	—	—	QBL22250	693.00	QBL32250	1812.00

▲ DE2A Discount Schedule

**Table 9.2: K-, L-, and M-frame, Individually-Mounted, IEC Rated 415/240 Vac Max., 50/60 Hz, 2P and 3P**

Frame Size	Circuit Breaker Type	Ampere Rating	2P		3P	
			Cat. No.	\$ Price	Cat. No.	\$ Price
250 A	SKIL	125 A	SKIL2125	6177.00	SKIL3125	7751.00
		160 A	SKIL2160	6177.00	SKIL3160	7751.00
		175 A	SKIL2175	6177.00	SKIL3175	7751.00
		200 A	SKIL2200	6177.00	SKIL3200	7751.00
		225 A	SKIL2225	6177.00	SKIL3225	7751.00
		250 A	SKIL2250	7223.00	SKIL3250	9080.00
400 A	SLAL	250 A	SLAL2250	3807.00	SLAL3250	4619.00
		300 A	SLAL2300	3807.00	SLAL3300	4619.00
		350 A	SLAL2350	3807.00	SLAL3350	4619.00
		400 A	SLAL2400	3807.00	SLAL3400	4619.00





**Table 9.3: P-frame—1600 A, Individually-Mounted, Micrologic® Electronic Trip Unit, IEC Rated 415/240 Vac Max., 3P**

Sensor Rating	N Interrupting		H Interrupting		L Interrupting		Terminal Wire Range (AWG–kcmil)
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>3P, 690 Vac 50/60 Hz with LSO Trip Functions</b>							
630 A	PNLE36063U32R	13958.00	PHLE36063U32R	14792.00	PLLE36063U32R	15626.00	(4) 3/0–500 Al/Cu
800 A	PNLE36080U32R	13958.00	PHLE36080U32R	14792.00	PLLE36080U32R	15626.00	
1000 A	PNLE36100U32R	18843.00	PHLE36100U32R	19985.00	PLLE36100U32R	21128.00	
1250 A	PNLE36125U32R	18843.00	PHLE36125U32R	19985.00	—	—	
1600 A	PNLE36160U32R	20163.00	PHLE36160U32R	21384.00	—	—	
<b>3P, 690 Vac 50/60 Hz with LSI Trip Functions</b>							
630 A	PNLE36063U33R	14280.00	PHLE36063U33R	15114.00	PLLE36063U33R	15947.00	(4) 3/0–500 Al/Cu
800 A	PNLE36080U33R	14280.00	PHLE36080U33R	15114.00	PLLE36080U33R	15947.00	
1000 A	PNLE36100U33R	19166.00	PHLE36100U33R	20309.00	PLLE36100U33R	21450.00	
1250 A	PNLE36125U33R	19166.00	PHLE36125U33R	20309.00	—	—	
1600 A	PNLE36160U33R	20508.00	PHLE36160U33R	21731.00	—	—	
<b>Micrologic Ammeter Trip Unit</b>							
<b>3P, 690 Vac 50/60 Hz with LSO Trip Functions</b>							
630 A	PNLE36063U42R	14768.00	PHLE36063U42R	15600.00	PLLE36063U42R	16434.00	(4) 3/0–500 Al/Cu
800 A	PNLE36080U42R	14768.00	PHLE36080U42R	15600.00	PLLE36080U42R	16434.00	
1000 A	PNLE36100U42R	19653.00	PHLE36100U42R	20795.00	PLLE36100U42R	21936.00	
1250 A	PNLE36125U42R	19653.00	PHLE36125U42R	20795.00	—	—	
1600 A	PNLE36160U42R	21030.00	PHLE36160U42R	22250.00	—	—	
<b>3P, 690 Vac 50/60 Hz with LSI Trip Functions</b>							
630 A	PNLE36063U43R	16191.00	PHLE36063U43R	17024.00	PLLE36063U43R	17858.00	(4) 3/0–500 Al/Cu
800 A	PNLE36080U43R	16191.00	PHLE36080U43R	17024.00	PLLE36080U43R	17858.00	
1000 A	PNLE36100U43R	21077.00	PHLE36100U43R	22218.00	PLLE36100U43R	23360.00	
1250 A	PNLE36125U43R	21077.00	PHLE36125U43R	22218.00	—	—	
1600 A	PNLE36160U43R	22551.00	PHLE36160U43R	23774.00	—	—	
<b>3P, 690 Vac 50/60 Hz with LSIG Trip Functions</b>							
630 A	PNLE36063U44R	17964.00	PHLE36063U44R	18798.00	PLLE36063U44R	19631.00	(4) 3/0–500 Al/Cu
800 A	PNLE36080U44R	17964.00	PHLE36080U44R	18798.00	PLLE36080U44R	19631.00	
1000 A	PNLE36100U44R	22850.00	PHLE36100U44R	23993.00	PLLE36100U44R	25134.00	
1250 A	PNLE36125U44R	22850.00	PHLE36125U44R	23993.00	—	—	
1600 A	PNLE36160U44R	24450.00	PHLE36160U44R	25671.00	—	—	
<b>Micrologic Power Trip Unit</b>							
<b>3P, 690 Vac 50/60 Hz with LSI Trip Functions</b>							
630 A	PNLE36063U63RE1	20382.00	PHLE36063U63RE1	21216.00	PLLE36063U63RE1	22049.00	(4) 3/0–500 Al/Cu
800 A	PNLE36080U63RE1	20382.00	PHLE36080U63RE1	21216.00	PLLE36080U63RE1	22049.00	
1000 A	PNLE36100U63RE1	25268.00	PHLE36100U63RE1	26409.00	PLLE36100U63RE1	27552.00	
1250 A	PNLE36125U63RE1	25268.00	PHLE36125U63RE1	26409.00	—	—	
1600 A	PNLE36160U63RE1	27036.00	PHLE36160U63RE1	28257.00	—	—	
<b>3P, 690 Vac 50/60 Hz with LSIG Trip Functions</b>							
630 A	PNLE36063U64RE1	21410.00	PHLE36063U64RE1	22244.00	PLLE36063U64RE1	23078.00	(4) 3/0–500 Al/Cu
800 A	PNLE36080U64RE1	21410.00	PHLE36080U64RE1	22244.00	PLLE36080U64RE1	23078.00	
1000 A	PNLE36100U64RE1	26297.00	PHLE36100U64RE1	27437.00	PLLE36100U64RE1	28578.00	
1250 A	PNLE36125U64RE1	26297.00	PHLE36125U64RE1	27437.00	—	—	
1600 A	PNLE36160U64RE1	28136.00	PHLE36160U64RE1	29358.00	—	—	

Note: See Digest for accessories and other information.

**Table 9.4: Interrupting Ratings**

	N		H		L	
	Icu	Ics (%Icu)	Icu	Ics (%Icu)	Icu	Ics (%Icu)
220/240 V	50 kA	75%	70 kA	50%	150 kA	100%
380/415 V	50 kA		70 kA			
440 V	50 kA		65 kA			
500/525 V	40 kA		50 kA			
660/690 V	30 kA		42 kA			

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**Table 9.5: R-frame—3200 A, Individually-Mounted, Micrologic® Electronic Trip Unit, IEC Rated 415/240 Vac Max., 3P**

Sensor Rating	N Interrupting		H Interrupting	
	Cat. No.	\$ Price	Cat. No.	\$ Price
<b>3P, 690 Vac 50/60 Hz with LS0 Trip Functions</b>				
1600 A	RNFE36160U32R	22004.00	RHFE34160U32R	23120.00
2000 A	RNFE36200U32R	22004.00	RHFE34200U32R	23120.00
2500 A	RNFE36250U32R	34607.00	RHFE34250U32R	36384.00
3200 A	RNFE36320U32R	34607.00	RHFE34320U32R	36384.00
<b>3P, 690 Vac 50/60 Hz with LSI Trip Functions</b>				
1600 A	RNFE36160U33R	22326.00	RHFE34160U33R	23441.00
2000 A	RNFE36200U33R	22326.00	RHFE34200U33R	23441.00
2500 A	RNFE36250U33R	34929.00	RHFE34250U33R	36707.00
3200 A	RNFE36320U33R	34929.00	RHFE34320U33R	36707.00
<b>Micrologic Ammeter Trip Unit</b>				
<b>3P, 690 Vac 50/60 Hz with LS0 Trip Functions</b>				
1600 A	RNFE36160U42R	22812.00	RHFE34160U42R	23928.00
2000 A	RNFE36200U42R	22812.00	RHFE34200U42R	23928.00
2500 A	RNFE36250U42R	35414.00	RHFE34250U42R	37194.00
3200 A	RNFE36320U42R	35414.00	RHFE34320U42R	37194.00
<b>3P, 690 Vac 50/60 Hz with LSI Trip Functions</b>				
1600 A	RNFE36160U43R	24234.00	RHFE34160U43R	25352.00
2000 A	RNFE36200U43R	24234.00	RHFE34300U43R	25352.00
2500 A	RNFE36250U43R	36837.00	RHFE34350U43R	38618.00
3200 A	RNFE36320U43R	36837.00	RHFE34320U43R	38618.00
<b>3P, 690 Vac 50/60 Hz with LSIG Trip Functions</b>				
1600 A	RNFE36160U44R	26010.00	RHFE34160U44R	27126.00
2000 A	RNFE36200U44R	26010.00	RHFE34200U44R	27126.00
2500 A	RNFE36250U44R	38612.00	RHFE34250U44R	41199.00
3200 A	RNFE36320U44R	38612.00	RHFE34320U44R	41199.00
<b>Micrologic Power Trip Unit</b>				
<b>3P, 690 Vac 50/60 Hz with LSI Trip Functions</b>				
1600 A	RNFE36160U63RE1	28425.00	RHFE34160U63RE1	29543.00
2000 A	RNFE36200U63RE1	28425.00	RHFE34200U63RE1	29543.00
2500 A	RNFE36250U63RE1	41030.00	RHFE34250U63RE1	42809.00
3200 A	RNFE36320U63RE1	41030.00	RHFE34320U63RE1	42809.00
<b>3P, 690 Vac 50/60 Hz with LSIG Trip Functions</b>				
1600 A	RNFE36160U64RE1	29454.00	RHFE34160U64RE1	30572.00
2000 A	RNFE36200U64RE1	29454.00	RHFE34200U64RE1	30572.00
2500 A	RNFE36250U64RE1	42057.00	RHFE34250U64RE1	43836.00
3200 A	RNFE36320U64RE1	42057.00	RHFE34320U64RE1	48386.00

Note: See Digest for accessories and other information.

**Table 9.6: Interrupting Ratings**

	N		H	
	Icu	Ics	Icu	Ics (%Icu)
220/240 V	85 kA	65 kA	125 kA	75%
380/415 V	70 kA		85 kA	
440 V	65 kA		85 kA	
500/525 V	65 kA		—	
660/690 V	65 kA		—	





**Table 9.7: P-frame—1600 A, Individually-Mounted, Micrologic® Electronic Trip Unit, IEC Rated 415/240 Vac Max., 4P**

Sensor Rating	N Interrupting		H Interrupting		L Interrupting		Terminal Wire Range (AWG–kcmil)
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>4P, 690 Vac 50/60 Hz with LSO Trip Functions</b>							
630 A	PNLE46063U32R	17307.00	PHLE46063U32R	18341.00	PLLE46063U32R	19376.00	(4) 3/0–500 Al/Cu
800 A	PNLE46080U32R	17307.00	PHLE46080U32R	18341.00	PLLE46080U32R	19376.00	
1000 A	PNLE46100U32R	23367.00	PHLE46100U32R	24783.00	PLLE46100U32R	26198.00	
1250 A	PNLE46125U32R	23367.00	PHLE46125U32R	24783.00	—	—	
1600 A	PNLE46160U32R	25002.00	PHLE46160U32R	26517.00	—	—	
<b>4P, 690 Vac 50/60 Hz with LSI Trip Functions</b>							
630 A	PNLE46063U33R	17708.00	PHLE46063U33R	18741.00	PLLE46063U33R	19776.00	(4) 3/0–500 Al/Cu
800 A	PNLE46080U33R	17708.00	PHLE46080U33R	18741.00	PLLE46080U33R	19776.00	
1000 A	PNLE46100U33R	23768.00	PHLE46100U33R	25182.00	PLLE46100U33R	26598.00	
1250 A	PNLE46125U33R	23768.00	PHLE46125U33R	25182.00	—	—	
1600 A	PNLE46160U33R	25430.00	PHLE46160U33R	26945.00	—	—	
<b>Micrologic Ammeter Trip Unit</b>							
<b>4P, 690 Vac 50/60 Hz with LSO Trip Functions</b>							
630 A	PNLE46063U42R	18311.00	PHLE46063U42R	19344.00	PLLE46063U42R	20378.00	(4) 3/0–500 Al/Cu
800 A	PNLE46080U42R	18311.00	PHLE46080U42R	19344.00	PLLE46080U42R	20378.00	
1000 A	PNLE46100U42R	24371.00	PHLE46100U42R	25787.00	PLLE46100U42R	27201.00	
1250 A	PNLE46125U42R	24371.00	PHLE46125U42R	25787.00	—	—	
1600 A	PNLE46160U42R	26076.00	PHLE46160U42R	27591.00	—	—	
<b>4P, 690 Vac 50/60 Hz with LSI Trip Functions</b>							
630 A	PNLE46063U43R	20076.00	PHLE46063U43R	21110.00	PLLE46063U43R	22143.00	(4) 3/0–500 Al/Cu
800 A	PNLE46080U43R	20076.00	PHLE46080U43R	21110.00	PLLE46080U43R	22143.00	
1000 A	PNLE46100U43R	26135.00	PHLE46100U43R	27551.00	PLLE46100U43R	28967.00	
1250 A	PNLE46125U43R	26135.00	PHLE46125U43R	27551.00	—	—	
1600 A	PNLE46160U43R	27964.00	PHLE46160U43R	29480.00	—	—	
<b>4P, 690 Vac 50/60 Hz with LSIg Trip Functions</b>							
630 A	PNLE46063U44R	22277.00	PHLE46063U44R	23310.00	PLLE46063U44R	24344.00	(4) 3/0–500 Al/Cu
800 A	PNLE46080U44R	22277.00	PHLE46080U44R	23310.00	PLLE46080U44R	24344.00	
1000 A	PNLE46100U44R	28335.00	PHLE46100U44R	29750.00	PLLE46100U44R	31166.00	
1250 A	PNLE46125U44R	28335.00	PHLE46125U44R	29750.00	—	—	
1600 A	PNLE46160U44R	30317.00	PHLE46160U44R	31833.00	—	—	
<b>Micrologic Power Trip Unit</b>							
<b>4P, 690 Vac 50/60 Hz with LSI Trip Functions</b>							
630 A	PNLE46063U63RE1	25274.00	PHLE46063U63RE1	26307.00	PLLE46063U63RE1	27341.00	(4) 3/0–500 Al/Cu
800 A	PNLE46080U63RE1	25274.00	PHLE46080U63RE1	26307.00	PLLE46080U63RE1	27341.00	
1000 A	PNLE46100U63RE1	31332.00	PHLE46100U63RE1	32748.00	PLLE46100U63RE1	34164.00	
1250 A	PNLE46125U63RE1	31332.00	PHLE46125U63RE1	32748.00	—	—	
1600 A	PNLE46160U63RE1	33525.00	PHLE46160U63RE1	35039.00	—	—	
<b>4P, 690 Vac 50/60 Hz with LSIg Trip Functions</b>							
630 A	PNLE46063U64RE1	26549.00	PHLE46063U64RE1	27582.00	PLLE46063U64RE1	28614.00	(4) 3/0–500 Al/Cu
800 A	PNLE46080U64RE1	26549.00	PHLE46080U64RE1	27582.00	PLLE46080U64RE1	28614.00	
1000 A	PNLE46100U64RE1	32606.00	PHLE46100U64RE1	34022.00	PLLE46100U64RE1	35438.00	
1250 A	PNLE46125U64RE1	32606.00	PHLE46125U64RE1	34022.00	—	—	
1600 A	PNLE46160U64RE1	34890.00	PHLE46160U64RE1	36404.00	—	—	

Note: See Digest for accessories and other information.

**Table 9.8: Interrupting Ratings**

	N		H		L	
	Icu	Ics (%Icu)	Icu	Ics (%Icu)	Icu	Ics (%Icu)
220/240 V	50 kA	75%	70 kA	50%	150 kA	100%
380/415 V	50 kA		70 kA			
440 V	50 kA		65 kA			
500/525 V	40 kA		50 kA			
660/690 V	30 kA		42 kA			

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**Table 9.9: R-frame—3200 A, Individually-Mounted, Micrologic® Electronic Trip Unit, IEC Rated 415/240 Vac Max., 4P**

Sensor Rating	N Interrupting		H Interrupting	
	Cat. No.	\$ Price	Cat. No.	\$ Price
<b>4P, 690 Vac 50/60 Hz with LS0 Trip Functions</b>				
1600 A	RNFE46160U32R	27284.00	RHFE44160U32R	28667.00
2000 A	RNFE46200U32R	27284.00	RHFE44200U32R	28667.00
2500 A	RNFE46250U32R	42911.00	RHFE44250U32R	45117.00
3200 A	RNFE46320U32R	42911.00	RHFE44320U32R	45117.00
<b>4P, 690 Vac 50/60 Hz with LSI Trip Functions</b>				
1600 A	RNFE46160U33R	27684.00	RHFE44160U33R	29067.00
2000 A	RNFE46200U33R	27684.00	RHFE44200U33R	29067.00
2500 A	RNFE46250U33R	43311.00	RHFE44250U33R	45518.00
3200 A	RNFE46320U33R	43311.00	RHFE44320U33R	45518.00
<b>Micrologic Ammeter Trip Unit</b>				
<b>4P, 690 Vac 50/60 Hz with LS0 Trip Functions</b>				
1600 A	RNFE46160U42R	28287.00	RHFE44160U42R	29670.00
2000 A	RNFE46200U42R	28287.00	RHFE44200U42R	29670.00
2500 A	RNFE46250U42R	43914.00	RHFE44250U42R	46119.00
3200A	RNFE46320U42R	43914.00	RHFE44320U42R	46119.00
<b>4P, 690 Vac 50/60 Hz with LSI Trip Functions</b>				
1600 A	RNFE46160U43R	30051.00	RHFE44160U43R	31436.00
2000 A	RNFE46200U43R	30051.00	RHFE44300U43R	31436.00
2500 A	RNFE46250U43R	45678.00	RHFE44350U43R	47885.00
3200 A	RNFE46320U43R	45678.00	RHFE44320U43R	47885.00
<b>4P, 690 Vac 50/60 Hz with LSIG Trip Functions</b>				
1600 A	RNFE46160U44R	32252.00	RHFE44160U44R	33636.00
2000 A	RNFE46200U44R	32252.00	RHFE44200U44R	33636.00
2500 A	RNFE46250U44R	47879.00	RHFE44250U44R	51087.00
3200 A	RNFE46320U44R	47879.00	RHFE44320U44R	51087.00
<b>Micrologic Power Trip Unit</b>				
<b>4P, 690 Vac 50/60 Hz with LSI Trip Functions</b>				
1600 A	RNFE46160U63RE1	35249.00	RHFE44160U63RE1	36633.00
2000 A	RNFE46200U63RE1	35249.00	RHFE44200U63RE1	36633.00
2500 A	RNFE46250U63RE1	50876.00	RHFE44250U63RE1	53082.00
3200 A	RNFE46320U63RE1	50876.00	RHFE44320U63RE1	53082.00
<b>4P, 690 Vac 50/60 Hz with LSIG Trip Functions</b>				
1600 A	RNFE46160U64RE1	36522.00	RHFE44160U64RE1	37907.00
2000 A	RNFE46200U64RE1	36522.00	RHFE44200U64RE1	37907.00
2500 A	RNFE46250U64RE1	52152.00	RHFE44250U64RE1	54357.00
3200 A	RNFE46320U64RE1	52152.00	RHFE44320U64RE1	54357.00

Note: See Digest for accessories and other information.

**Table 9.10: Interrupting Ratings**

	N		H	
	Icu	Ics	Icu	Ics (%Icu)
220/240 V	85 kA	65 kA	125 kA	75%
380/415 V	70 kA		85 kA	
440 V	65 kA		85 kA	
500/525 V	65 kA		—	
660/690 V	65 kA		—	



## Breaking Capacities

- CE Marking
- International products—IEC 60947-2 rated. North American products are dual rated, UL 489 and IEC 60947-2.
- MCCBs in I-Line® plug-on construction and a complete line of accessories are available. Contact your nearest Field Sales office.
- Order entry point is Cedar Rapids, Iowa.

**Table 9.11: Circuit Breaker Breaking Capacities**

Circuit Breaker Cat. Prefix		Current Rating (Amps)	Short-circuit Ratings (415 Vac)			Isolator Rating	Impulse Rating U <sub>imp</sub> (kV)	Insulation Rating U <sub>i</sub> (Vac)
International	North America		Ultimate	Service	Withstand			
			I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cw</sub>			
—	FA, FH	15–100 A	10 kA	2.5 kA	N/A	Yes	6	750
—	FA, FH (1 pole)▲	15–100 A	18 kA	9 kA	N/A	Yes	6	750
SFA (1 pole)▲	—	16–100 A	25 kA	12.5 kA	N/A	Yes	6	750
SFA■	—	16–160 A	25 kA	12.5 kA	N/A	Yes	6	750
—	FC	15–100 A	10 kA	2.5 kA	N/A	Yes	6	750
SFH	—	16–63 A	65 kA	50 kA	N/A	Yes	6	750
—	—	80–100 A	65 kA	33 kA	N/A	Yes	6	750
—	FI	20–100 A	6 kA	1.5 kA	N/A	Yes	6	750
SFI	—	20–100 A	150 kA	75 kA	N/A	Yes	6	750
—	QB♦	70–250 A★	10 kA	5 kA	N/A	Yes	6	750
—	KA, KH	70–250 A	10 kA	2.5 kA	N/A	Yes	6	750
SKI	KI	125–250 A	130 kA	65 kA	N/A	Yes	6	750
—	LA	125–400 A	20 kA	5 kA	N/A	Yes	6	750
SLA	—	250–400 A	36 kA	18 kA	N/A	Yes	6	750
LC	LC	300–400 A	65 kA	65 kA	N/A	Yes	6	750
—	—	450–630 A	65 kA	50 kA	N/A	Yes	6	750
LE	LE	100–400 A	65 kA	65 kA	N/A	Yes	6	750
LX	LX	450–600 A	65 kA	50 kA	N/A	Yes	6	750
—	LH	125–400 A	20 kA	5 kA	N/A	Yes	6	750
—	MA	300–800 A	30 kA	30 kA	N/A	Yes	6	750
—	MAL	300–1000 A	30 kA	30 kA	N/A	Yes	6	750
SMA, SMAL	—	300–800 A	50 kA	25 kA	N/A	Yes	6	750
—	—	300–1000 A	50 kA	25 kA	N/A	Yes	6	750
SMH, SMHL	MH	300–800 A	65 kA	33 kA	N/A	Yes	6	750
—	MHL	300–1000 A	65 kA	33 kA	N/A	Yes	6	750
ME, MX	ME, MX	450–800 A	65 kA	33 kA	8.0 kA	Yes	6	750
SNA	—	630–1250 A	50 kA	25 kA	N/A	No	6	750
SNC	—	630–1250 A	70 kA	35 kA	N/A	No	6	750
NE, NX	NE, NX	600–1200 A	70 kA	35 kA	16.0	No	6	750
—	NC	600–1200 A	70 kA	35 kA	N/A	No	6	750
—	NA	600–1200 A	50 kA	25 kA	N/A	No	6	750
—	PG	250–1200 A	35 kA	17.5 kA	25 kA	Yes	6	750
	PJ		50 kA	25 kA	10 kA			
	PL		85 kA	42.5 kA	10 kA			
	PK		50 kA	25 kA	25 kA			
—	RG	600–2500 A	35 kA	17.5 kA	32 kA	Yes	6	750
	RJ		50 kA	25 kA	32 kA			
	RL		85 kA	42.5 kA	32 kA			
	RK		70 kA	52.5 kA	32 kA			
—	PA	600–2000 A	50 kA	38 kA	N/A	No	6	750
—	PC, PH	600–2500 A	70 kA	53 kA	N/A	No	6	750
PE, PX	PE, PX	600–2500 A	70 kA	53 kA	12.5	No	6	750

- ▲ Single pole ratings are 240 V.
- SFA 2 & 3 pole marked Line and Load.
- ♦ IEC rating 415Y/240 Vac; NEMA/UL rating 240 Vac.
- ★ 250 A lugs are suitable for copper conductors only.

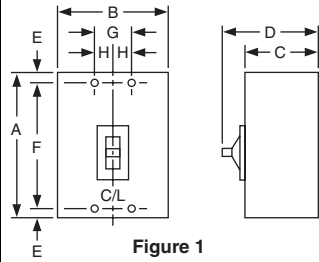


Figure 1

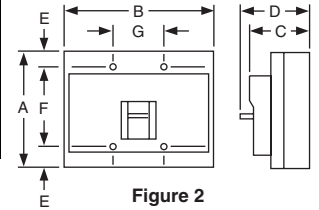


Figure 2

- CE Marking
- International products—IEC 60947-2 rated. North American products are dual rated, UL 489 and IEC 60947-2.
- MCCBs in I-Line® plug-on construction and a complete line of accessories are available. Contact your nearest Field Sales office.
- Order entry point is Cedar Rapids, Iowa.

**Table 9.12: Dimensions**

Circuit Breaker	No. Poles	Fig. No.	Dimensions – mm							
			A	B	C	D	E	F	G	H
SFA, SFH/FS, FH	3	1	152	114	80	105	11	130	38	19
SF/FI	3	1	203	114	93	121	11	181	38	19
KA, KH, KC	3	1	203	114	93	121	11	181	38	19
SKI/KI	3	1	203	114	93	121	11	181	38	19
SLA/LA, LH	3	1	279	152	103	148	22	235	51	25
SMA, SMH/MA, MH	3	1	356	229	115	165	42	272	76	38
SNA, SNC/NA, NC	3	2	308	381	163	205	43	222	127	—
PA, PH	3	3	511	348	184	364	356	305	324	—
PC	3	4	663	592	339	419	356	305	—	—
QB	2	5	164	76	77	100	▲	108	—	—
	3	6	164	114	77	100	▲	108	38	19
PG, PJ, PL	2, 3	7	414	210	140	204	106	200	200	—
RG, RJ, RL	2, 3	8	381	420	160	365	222	362	390	—

▲ Dimensions E are 40 mm at ON end and 16 mm at OFF end.

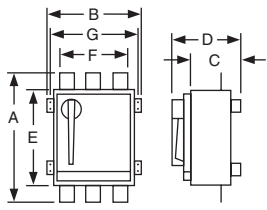


Figure 3

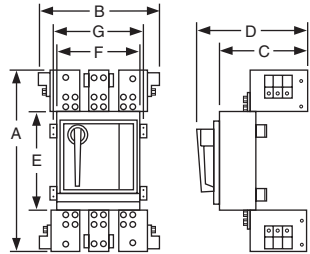


Figure 4

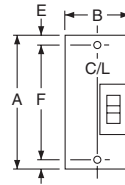


Figure 5

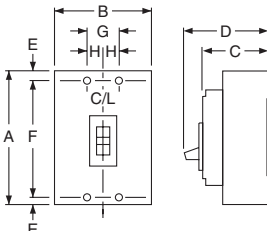


Figure 6

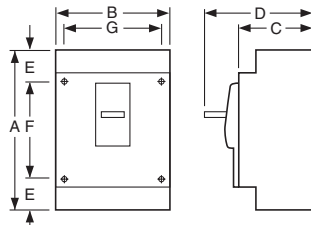


Figure 7

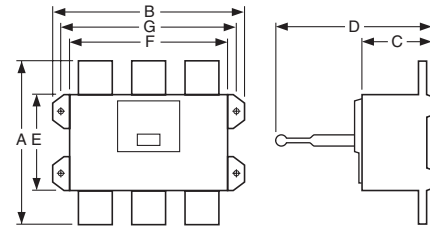


Figure 8

**10 International Panelboards**

**NQX Panelboards (Replace NQODX panelboards)**

Factory Assembled Circuit Breaker Panelboards

10-1

**NQX Factory Assembled Circuit Breaker Panelboards**

**Application** For export application only. Not UL Listed.

**Service** 1Ø3W 110/220, 115/230/ Vac 50 Hz, 60 Hz  
3Ø4W 220/110, 220/127, 230/115, 380/220, 415V/240 Vac 50 Hz, 60 Hz

**Mains**



NQX Panelboard

Mains Rating	Main Lugs	Main Circuit Breaker
70 A	—	QOBXD▲, QB, HD
100 A	Yes	QOBXD▲, QB, HD
150 A	—	QB, HD
225 A	Yes	QB
250 A	—	JD
400 A	Yes	SLA
600 A	Yes	—

▲ Available at 240 Vac maximum.

**Distributed Phase Bussing**

Main Lugs		Main Circuit Breaker		
100 A	(1) #6-2/0 Al or Cu	100 A	QOXD/QOBXD	(1) #4-2/0 Al or Cu
225 A	(1) #6-350 kcmil Al or Cu	150 A	HD	(1) #14-3/0 Al or Cu
400 A	(1) 1/0-750 kcmil, or	225 A	QB	(1) #4-300 kcmil Al or Cu, or
	(2) 1/0-350 kcmil Al or Cu		JD	(1) #3/0-350 kcmil Al or Cu
600 A	(2) 1/0-750 kcmil Al or Cu	250 A	JD	(1) #3/0-350 kcmil Al or Cu
		400 A	SLA	(1) #1-600 kcmil, or (2) #1-250 kcmil Al or Cu

**Branches** Plug-on QOXD and Bolt-on QOBXD  
10–100 A QOXD and QOBXD 1-, 2-, and 3-pole (3000 AIR)

**Boxes** Galvanized steel with removable endwalls with knockouts on one end.  
Two sizes:

- NQB — 14 in. W x 5.75 in. D — 225 A interior maximum (availability to be announced)
- MH — 20 in. W x 5.75 in. D — 600 A main lug interior maximum

**Fronts** Features:

- Gray baked enamel finish (ANSI49)
- Door with flush lock
- Mono-Flat® fronts on 100–225 A. Front mounts to the interior with trim screws. (Both trim screws and door hinges are concealed.)
- Fronts for 400A–600 A interiors are louvered and mount to the enclosure with trim screws. (Door hinges are concealed.)

**Common Features** Sub-Feed Lugs, Sub-Feed Circuit Breaker, Split Bus, Feed-Through Lugs

**Bus Bars**

- Aluminum bus, standard — 100 A, 225 A, and 400 A interiors
- Copper bus, optional — 100 A, 225 A, and 400 A interiors
- Copper bus, standard — 600 A interiors

**Neutrals**

- 100% Aluminum neutral, standard
- 100% Copper neutral, optional
- 200% Neutral, optional

**Enclosures**

- Type 1, standard
- Type 3R, 5, and 12, optional
- Type 3R, 4, 4X, and 12 Stainless Steel, optional

**NOTE:** Price factory assembled NQX panelboard in the Quote to Cash Product Selector. Select "NQ" panelboard, then select the appropriate "International Voltage".

**Order Point** Peru, IN



by Schneider Electric

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## 11 Obsolete and Obsolete Circuit Breakers

### Obsolete and Obsolete Types

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### Obsolete Circuit Breakers

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Table 11.1: Circuit Breaker Availability

Series of Cat. No.	Frame Size	Volts	Poles	Amperes	Availability	
					Obsolete No Longer Available	Obsolescent
115A-130A	MO-1 (Add-on)	120 Vac	1	15-30	X	
215A-250A	MO-2 (Add-on)	120/240 Vac	2	15-50	X	
215B-250B	MO-2B (Add-on)	120/240 Vac	2 S.P.	15-50	X	
70000	Multi-Breaker	120 Vac	4 S.P.	15-50	X	
111600	MO-2	120/240 Vac	2	15-30	X	
131600	MO-2	120/240 Vac	2	15-30	X	
151101	MO-1	120 Vac	1	15-30	X	
151600	MO-2	120/240 Vac	2	15-30	X	
161101	MO-1	120 Vac	1 With SN	15-30	X	
161600	MO-2	120/240 Vac	2 With SN	15-30	X	
161700	MO-2	120/240 Vac	2 S.P.	15-30	X	
260000	MB (Left-hand)	120 Vac	4 S.P.	15-50	X	
270000	MB (Right-hand)	120 Vac	4 S.P.	15-50	X	
460000	MO-8	120/240 Vac	4 S.P.	15-50	X	
470000	MO-4	120/240 Vac	4 S.P.	15-40	X	
480000	MO-4 (Plug-in)	120/240 Vac	4 S.P.	15-50	X	
940000	LM	600 Vac	2-3	125-800	X	
950000	50 A Form W	250 Vac	1, 2, 3	15-50	X	
951000	50 A Form W	250 Vac	2, 3	15-50	X	
952000	50 A Form W	250 Vac	2, 3	15-50	X	
953000	Flip-on Form W	230 Vac	1, 2, 3	15-50	X	
954000	100 A Form W (Trip Unit)	250 Vac	2, 3	50-100	X	
955000	100 A Form W	250 Vac	2, 3	50-100	X	
956000	225 A Form W	250 Vac	2, 3	70-225	X	
957000	400 A (KL) Form W	250 Vac	2, 3	125-400	X	
958000	600 A (WL) Form W	250 Vac	2, 3	225-600	X	
959000	KL Frame Only	600 Vac	2, 3	125-400	X	
961000	50 A Form W	600 Vac	2, 3	15-50	X	
962000	50 A Form W	600 Vac	2, 3	15-50	X	
964000	100 A Form W	600 Vac	2, 3	50-100	X	
965000	100 A Form W	600 Vac	2, 3	50-100	X	
966000	225 A Form W	600 Vac	2, 3	70-225	X	
967000	400 A (KL) Form W	600 Vac	2, 3	125-400	X	
968000	600 A (WL) Form W	600 Vac	2, 3	225-600	X	
970000	Type L Form W	240 Vac	1, 2, 3	10-50	X	
971000	Type L Form W (Flip-on)	240 Vac	1, 2, 3	10-50	X	
972000	M1 (Bolt-on)	240 Vac	2, 3	15-70	X	
973000	M2 (Bolt-on)	240 Vac	2, 3	50-100	X	
974000	MM (M) (Bolt-on)	120/240 Vac	2 S.P.	15-50	X	
975000	100 A Trip Unit	250 Vac	2, 3	50-100	X	
976000	225 A Trip Unit	250 Vac	2, 3	70-225	X	
977000	KL Trip Unit	600 Vac	2, 3	125-400	X	
978000	LM Trip Unit	600 Vac	2, 3	225-800	X	
979000	WL Frame	600 Vac	2, 3	225-600	X	
982000	50 A Form W (Flip-on)	125/250 Vac	1, 2, 3	15-50	X	
984000	ML-2	250 Vac	2, 3	50-100	X	
985000	100 A (G) Form W	600 Vac	2, 3	50-100	X	
986000	100 A (F) Form W	600 Vac	2, 3	10-100	X	
987000	ML-3	250 Vac	2, 3	125-225	X	
988000	ML-1	250 Vac	2, 3	15-100	X	
989000	ML-1	480 Vac	2, 3	15-100	X	
991000	QB	120/240 Vac	1	15-50	X	
992000	ML	120/240 Vac	1, 2, 3	10-50	X	
992900	ML Form Y	277 Vac	1	10-20	X	
994000	ML-2	600 Vac	2, 3	15-100	X	
995000	100 A (G) Form W	600 Vac	2, 3	15-100	X	
996000	100 A (F) Form W	600 Vac	2, 3	15-100	X	
997000	ML-3	600 Vac	2, 3	50-225	X	
998000	ML-1	600 Vac	2, 3	15-100	X	
999000	ML-1	600 Vac	2, 3	15-100	X	
A1B	100 A	120/240 Vac	1, 2, 3	15-100	X	
EH, EHB	100 A	480Y/277 Vac	1, 2, 3	15-100		See page 11-12
FD, FG, FJ	100 A	480Y/277 Vac	1, 2, 3	15-100	FD, FG	FJ, page 11-13
IF, IFL	100 A	480 Vac	2, 3	20-100	X	
IK, IKL	225 A	480 Vac	2, 3	110-225	X	
IL, ILL	400 A	480 Vac	2, 3	300-400		See page 11-16
KD, KG	250 A	240 Vac	2, 3	100-250		See page 11-15
LA(JKL) 0000	400 A	600 Vac	2, 3	125-400	X	
MA-0000	1000 A	600 Vac	2, 3	125-1000	X	
Masterpact	6300 A	600 Vac	3, 4	800-6300		See pgs. 11-20-11-36
MEC	225 A	600 Vac	2, 3	100-225	X	
MEC	400 A	600 Vac	2, 3	250-400	X	
MEC	800 A	600 Vac	2, 3	400-800	X	
MHAB, BC, CA	MM (Plug-on)	120/240 Vac	2 S.P.	15-50	X	
MHAB, BC, CA	M1 (Plug-on)	120/240 Vac	2, 3	15-70	X	
MHAB, BC, CA	M2 (Plug-on)	120/240 Vac	2, 3	70-100	X	
NHL	1200 A	480 Vac	2, 3	800-1200		See page 11-17
PEC	1200 A	600 Vac	2, 3	600-1200	X	
PEC	1600 A	600 Vac	2, 3	1000-1600	X	
PEC	2000 A	600 Vac	2, 3	1000-2000	X	
QOT	Series 1	120/240 Vac	1, 2	30	X	
Q1, Q1B	150 A	120/240 Vac	1, 2	15-100	X	
Q1, Q1B	150 A	240 Vac	3	15-100	X	
Q1-H, Q1B-H	100 A	240 Vac	2	15-100	X	
Q1-VH, Q1B-VH	125 A	120/240 Vac	2	15-30	X	
Q1-VH, Q1B-VH	100 A	240 Vac	3	15-30	X	
Q2, Q2-H, Q2H	225 A	240 Vac	2, 3	100-225	X	
QE	200 A	120/240 Vac	2, 3	70-200		See page 11-14
SE	4000 A	600 Vac	3	200-4000		See pgs. 11-18-11-19
XO	50 A	120/240 Vac	1, 2	15-50	X	
Y1B	100 A	277 Vac	1	15-100	X	

Contact your local Sales Office for availability.

11 OBSOLETE CIRCUIT BREAKERS



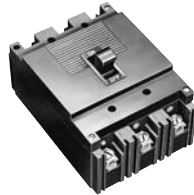
ILL



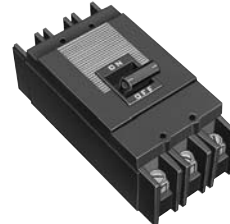
LA (W)



MA (W)



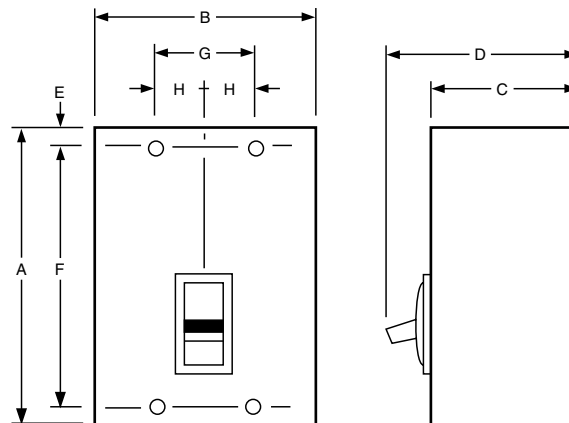
ML-1



ML-2

Table 11.2: Circuit Breaker Dimensions

Circuit Breaker Type	Cat. No. Prefix	Number Poles	Dimensions															
			A		B		C		D		E		F		G		H	
			in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
QB	991	1	3.75	95	1.00	25	2.50	63	3.06	78	—	—	—	—	—	—	—	—
ML	992	1	6.00	152	1.00	25	3.09	78	3.91	99	.88	22	4.25	108	—	—	.33	8
	992	2	6.00	152	2.00	51	3.09	78	3.91	99	.88	22	4.25	108	—	—	.19	5
	992	3	6.00	152	3.00	76	3.09	78	3.91	99	.88	22	4.25	108	—	—	1.83	46
ML-1	999	2 & 3	6.50	165	4.47	113	3.06	78	3.94	100	.94	24	4.25	108	1.50	38	.75	19
ML-2	994	2 & 3	9.56	243	4.47	113	3.75	95	4.88	124	1.69	43	6.50	165	1.50	38	.75	19
ML-3	997	2 & 3	10.38	264	5.97	152	3.88	98	5.31	135	1.69	43	6.63	168	2.00	51	1.00	25
LA (W)	LA	2 & 3	10.75	273	8.25	209	4.31	109	5.50	140	.63	16	9.50	241	2.75	70	1.38	35
MA (W)	MA	2 & 3	16.00	406	8.25	209	4.06	103	6.06	154	.88	22	14.25	362	2.75	70	1.38	35
KL	967	2 & 3	22.00	559	8.25	209	5.50	140	7.00	178	.63	16	20.75	527	2.75	70	1.38	35
LM	940	2 & 3	22.00	559	8.25	209	5.50	140	7.00	178	.63	16	20.75	527	2.75	70	1.38	35
IFL (4)	IFL	2 & 3	8.29	210	4.46	113	3.67	93	4.70	119	.44	11	7.41	188	1.50	38	.75	19
IKL (4)	IKL	2 & 3	11.00	279	6.00	152	4.02	102	5.51	140	.88	22	9.25	235	2.00	51	1.00	25
ILL	ILL	2 & 3	11.00	279	12.00	305	4.05	103	6.11	155	.88	22	9.25	235	4.00	102	2.00	51
NHL	NHL	2 & 3	20.00	508	12.00	305	5.75	146	8.12	206	5.87	149	7.76	197	4.00	102	2.00	51



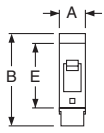


Figure 1

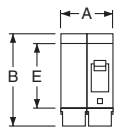


Figure 2

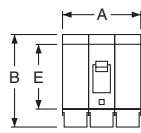
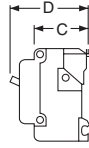


Figure 3



EH, EHB

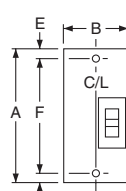


Figure 4

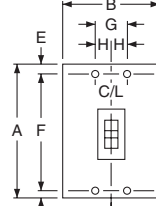
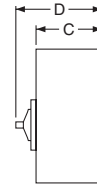


Figure 5



Q2L

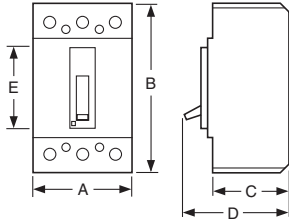


Figure 6

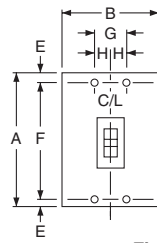


Figure 7

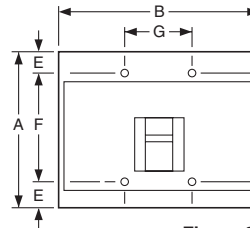
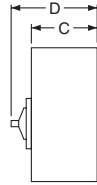


Figure 8

Table 11.3: Circuit Breaker Dimensions

Circuit Breaker Cat. No. Prefix	No. Poles	Fig. No.	Dimensions—In.							
			A	B	C	D	E	F	G	H
EH, EHB	1	1	1.00	3.50	2.00	2.97	2.44	—	—	—
	2	2	2.00	3.50▲	2.00	2.97	2.44	—	—	—
	3	3	3.00	3.50▲	2.00	2.97	2.44	—	—	—
FDA, FGA, FJA	1		Width 1.50							
	2, 3		Width 3.00							
Q2L, Q2L-H	2	4	6.44	3.00	3.16	3.92	■	4.25	—	—
	3	5	6.44	4.50	3.16	3.92	■	4.25	1.50	0.75
KD, KG	2, 3	6	4.12	7.35	3.20	4.17	3.34	—	—	—
MXL, MEL	2 & 3	7	14.75	9.00	4.37	6.50	1.66	11.43	3.00	1.50
NAL, NCL, NEL, NXL	2 & 3	8	12.12	14.98	6.40	8.07	1.69	8.75	5.00	—

▲ 70–100 A is 4.00 in.

■ Dimensions E are 1.59 in at ON end and 0.63 in at OFF end.

Thermal-magnetic molded case circuit breakers shown on pages 11-5 through 3-13 are permanent trip UL Listed, CSA® Certified, IEC rated, and also meet the requirements of Federal Specification W-C-375B/GEN as indicated on Digest pages 7-4 through 7-7.

**NOTE:** Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories. See Digest Section 7 for more information.



FAL/FHL 2P  
15-100 A



FAL/FHL 3P  
15-100 A

**Table 11.4: F-Frame—100 A, Thermal-Magnetic, Individually-Mounted, 480 Vac**

Ampere Rating	Fixed AC Magnetic Trip		Extra-High Interrupting				Terminal Wire Range (AWG)
			2P		3P		
			480 Vac, 250 Vdc		480 Vac, 250 Vdc		
Hold	Trip	Cat. No.	\$ Price	Cat. No.	\$ Price		
15 A	275 A	600 A	—	—	FCL34015	—	CU30FA4 (1) 14-10 Cu
20 A	275 A	600 A	—	—	FCL34020	—	
25 A	275 A	600 A	—	—	FCL34025	—	
30 A	275 A	600 A	—	—	FCL34030	—	
35 A	400 A	850 A	—	—	FCL34035	—	AL100FA4 (1) 14-3 Cu or (2) 12-1 Al
40 A	400 A	850 A	—	—	FCL34040	—	
45 A	400 A	850 A	—	—	FCL34045	—	
50 A	400 A	850 A	FCL24050	—	FCL34050	—	
60 A	800 A	1450 A	FCL24060	—	FCL34060	—	
70 A	800 A	1450 A	FCL24070	—	FCL34070	—	
80 A	800 A	1450 A	FCL24080	—	FCL34080	—	
90 A	900 A	1700 A	FCL24090	—	FCL34090	—	
100 A	900 A	1700 A	FCL24100	—	FCL34100	—	

**For pricing contact your local Schneider Electric distributor.**

**Table 11.5: Interrupting Ratings**

Voltage	FAL			FHL	FCL	FIL
	240 Vac	480 Vac	600 Vac			
240 Vac	10 kA	18 kA (1P), 25 kA (2P, 3P)	25 kA	25 kA (1P) 65 kA (2P, 3P)	100 kA	200 kA
480 Vac	—	18 kA	18 kA	25 kA (2P, 3P)	65 kA	200 kA
600 Vac	—	—	14 kA	18 kA (2P, 3P)	—	100 kA

**Termination Option**

**Termination Letter**  
F = No Lugs  
L = Lugs both ends  
P with MT Suffix = Lugs ON end  
P = Lugs OFF end

For factory-installed termination, place termination letter in the third block of the circuit breaker catalog number.

**FAL36100**

Termination Letter



FA 2P  
3 in. (76 mm)  
Mounting Height



FA 3P  
4.5 in. (114 mm)  
Mounting Height

**Table 11.6: F-Frame—100 A, Thermal-Magnetic, I-Line® Construction, 480 Vac**

Ampere Rating	Fixed AC Magnetic Trip		Extra-High Interrupting♦				Terminal Wire Range (AWG)
			2P▲		3P		
			480 Vac, 250 Vdc■		480 Vac, 250 Vdc♦		
Hold	Trip	Cat. No.	\$ Price	Cat. No.	\$ Price		
15 A	275 A	600 A	—	—	FC34015	—	CU30FA4 (1) 14-10 Cu
20 A	275 A	600 A	—	—	FC34020	—	
25 A	275 A	600 A	—	—	FC34025	—	
30 A	275 A	600 A	—	—	FC34030	—	
35 A	400 A	850 A	—	—	FC34035	—	AL100FA4 (1) 14-3 Cu or (1) 12-1 Al
40 A	400 A	850 A	—	—	FC34040	—	
45 A	400 A	850 A	—	—	FC34045	—	
50 A	400 A	850 A	FC24050()	—	FC34050	—	
60 A	800 A	1450 A	FC24060()	—	FC34060	—	
70 A	800 A	1450 A	FC24070()	—	FC34070	—	
80 A	800 A	1450 A	FC24080()	—	FC34080	—	
90 A	900 A	1700 A	FC24090()	—	FC34090	—	
100 A	900 A	1700 A	FC24100()	—	FC34100	—	

**For pricing contact your local Schneider Electric distributor.**

- ▲ 1P and 2P circuit breaker catalog numbers are completed by adding the required phase connection letters as a suffix. See Phase Option Table.
- FCL 2P circuit breakers are built using 3P module.
- ♦ FCL circuit breakers are not rated for 250 Vdc.

**Table 11.7: Phase Options**

Phase Option Letter	1P	2P	3P
A B C	FA14035A FA14035B FA14035C		
AB AC BC		FA24030AB FA24030AC FA24030BC	
ABC CBA			FA34030 FA34030CBA

**Table 11.8: Interrupting Ratings**

Voltage	FA			FH	FC	FI
	240 Vac	480 Vac	600 Vac			
240 Vac	10 kA	18 kA (1P), 25 kA (2P, 3P)	25 kA	25 kA (1P) 65 kA (2P, 3P)	100 kA	200 kA
277 Vac	—	18 kA	—	—	65 kA	—
480 Vac	—	18 kA	18 kA	25 kA (2P, 3P)	65 kA	200 kA
600 Vac	—	—	14 kA	18 kA (2P, 3P)	—	100 kA

Accessories ..... Page 3-26—3-28  
Optional Lugs ..... Page 3-29—3-30  
Dimensions ..... Page 3-35  
Enclosures: see Digest Section 7

NOTE: Consider using PowerPact® circuit breakers for situations requiring circuit breaker accessories.

**Table 11.9: K-Frame—250 A, Thermal-Magnetic, Individually-Mounted, 600 Vac**

Ampere Rating	Adjustable AC Magnetic Trip▲		Standard Interrupting		High Interrupting		Extra-High Interrupting■		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2P, 600 Vac, 250 Vdc</b>									
70	350 A	700 A	KAL26070		KHL26070		—	—	AL250KA (1) 4 AWG–350 kcmil Al
80	400 A	800 A	KAL26080		KHL26080		—	—	
90	450 A	900 A	KAL26090		KHL26090		—	—	
100	500 A	1000 A	KAL26100		KHL26100		—	—	
110	550 A	1100 A	KAL26110		KHL26110		KCL24110	—	
125	625 A	1250 A	KAL26125		KHL26125		KCL24125	—	
150	750 A	1500 A	KAL26150		KHL26150		KCL24150	—	
175	875 A	1750 A	KAL26175		KHL26175		KCL24175	—	
200	1000 A	2000 A	KAL26200		KHL26200		KCL24200	—	
225	1125 A	2250 A	KAL26225		KHL26225		KCL24225	—	
250	1250 A	2500 A	KAL26250		KHL26250		KCL24250	—	
<b>3P, 600 Vac, 250 Vdc</b>									
70	350 A	700 A	KAL36070		KHL36070		—	—	AL250KA (1) 4 AWG–350 kcmil Al
80	400 A	800 A	KAL36080		KHL36080		—	—	
90	450 A	900 A	KAL36090		KHL36090		—	—	
100	500 A	1000 A	KAL36100		KHL36100		—	—	
110	550 A	1100 A	KAL36110		KHL36110		KCL34110	—	
125	625 A	1250 A	KAL36125		KHL36125		KCL34125	—	
150	750 A	1500 A	KAL36150		KHL36150		KCL34150	—	
175	875 A	1750 A	KAL36175		KHL36175		KCL34175	—	
200	1000 A	2000 A	KAL36200		KHL36200		KCL34200	—	
225	1125 A	2250 A	KAL36225		KHL36225		KCL34225	—	
250	1250 A	2500 A	KAL36250		KHL36250		KCL34250	—	



**For pricing contact your local Schneider Electric distributor.**

**Table 11.10: K-Frame—250A, Thermal-Magnetic, I-Line® Construction, 600 Vac**

Ampere Rating	Adjustable AC Magnetic Trip▲		Standard Interrupting		High Interrupting		Extra-High Interrupting■		Terminal Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2P, 600 Vac, 250 Vdc♦</b>									
70	350 A	700 A	KA26070()		KH26070()		—	—	AL250KA (1) 4 AWG–350 kcmil Al
80	400 A	800 A	KA26080()		KH26080()		—	—	
90	450 A	900 A	KA26090()		KH26090()		—	—	
100	500 A	1000 A	KA26100()		KH26100()		—	—	
110	550 A	1100 A	KA26110()		KH26110()		KC24110()	—	
125	625 A	1250 A	KA26125()		KH26125()		KC24125()	—	
150	750 A	1500 A	KA26150()		KH26150()		KC24150()	—	
175	875 A	1750 A	KA26175()		KH26175()		KC24175()	—	
200	1000 A	2000 A	KA26200()		KH26200()		KC24200()	—	
225	1125 A	2250 A	KA26225()		KH26225()		KC24225()	—	
250	1250 A	2500 A	KA26250()		KH26250()		KC24250()	—	
<b>3P, 600 Vac, 250 Vdc</b>									
70	350 A	700 A	KA36070		KH36070		—	—	AL250KA (1) 4 AWG–350 kcmil Al
80	400 A	800 A	KA36080		KH36080		—	—	
90	450 A	900 A	KA36090		KH36090		—	—	
100	500 A	1000 A	KA36100		KH36100		—	—	
110	550 A	1100 A	KA36110		KH36110		KC34110	—	
125	625 A	1250 A	KA36125		KH36125		KC34125	—	
150	750 A	1500 A	KA36150		KH36150		KH34150	—	
175	875 A	1750 A	KA36175		KH36175		KC34175	—	
200	1000 A	2000 A	KA36200		KH36200		KC34200	—	
225	1125 A	2250 A	KA36225		KH36225		KC34225	—	
250	1250 A	2500 A	KA36250		KH36250		KC34250	—	



KA/KH/KC 2P and 3P  
4.5 in. (114 mm)  
Mounting Height

**For pricing contact your local Schneider Electric distributor.**

- ▲ UL magnetic trip setting tolerances are ±25% for low and ±20% for high from nominal value shown.
- KC circuit breakers are 480 Vac
- ♦ 2P and 3P circuit breaker catalog numbers are completed by adding the required phase connection letters as a suffix. See Phase Option Table.

**Table 11.11: Interrupting Ratings**

Voltage	KA, KAL	KH, KHL	KC, KCL	KI, KIL
240 Vac	42 kA	65 kA	100 kA	200 kA
480 Vac	25 kA	35 kA	65 kA	200 kA
600 Vac	22 kA	25 kA	—	100 kA

**Table 11.12: Phase Options**

Phase Option Letter	2P	3P
AB	KA26250AB	
AC	KA26250AC	
BC	KA26250BC	
ABC CBA		KA36250 KA36250CBA

**For pricing contact your local Schneider Electric distributor.**

**Table 11.13: Walking Beam Mechanical Interlock Components**

Circuit Breaker Prefix	Manually Operated						Electrically Operated								
	Operator Suffix	\$ Price Adder	Walking Beam Ass'y.		Mounting Pan		Operator Suffix	\$ Price Adder	Walking Beam Ass'y.		Mounting Pan				
			Cat. No.	\$ Price	Cat. No.	\$ Price			Cat. No.	\$ Price	Cat. No.	\$ Price			
KAL	WB		KA4WB		KA4WB		WBMO		KA9WB		KA9WB		KA9WB		KA9WB

★ Walking Beam Mechanical Interlock requires 2 circuit breakers with WB suffix, 1 walking beam assembly and 1 mounting pan.  
▼ Fully enclosed interlocked units are available in Type 1 and Type 3R enclosures, with two neutrals provided in each enclosure. The completely enclosed assembly is not UL Listed. Consult your nearest Schneider Electric local sales office for more information.

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Enclosures: see Digest Section 7

**Automatic Molded Case Switches**

Automatic molded case switches open instantaneously at a factory preset magnetic trip point, calibrated to protect only the molded case switch itself, when it is subjected to high fault currents. The trip point is nonadjustable and provides no overload or low level fault protection.

Molded case switches open when the handle is switched to the OFF position or in response to an auxiliary tripping device such as a shunt trip.

Automatic switches will accept the same lugs and accessories as equivalent thermal-magnetic circuit breakers.

Automatic molded case switches are UL Listed per UL 489 and are CSA® Certified.

**For pricing contact your local  
Schneider Electric distributor.**

**Table 11.14: Automatic Molded Case Switches, 600 Vac**

Ampere Rating	2P		3P		Withstand Rating♦				Trip Point (A)		Lug Kit Installed
	Cat. No.	\$ Price	Cat. No.	\$ Price	240 Vac	480 Vac	600 Vac	250 Vdc	AC▲	DC▲	
250	KHL26000M■		KHL36000M■		65k	35k	25k	10k	4500	5175	AL250KA

- ▲ UL magnetic trip tolerances are -20% / +30% from the nominal values shown.
- KHL automatic switches will not accept cylinder lock attachments.
- ♦ The withstand rating is the fault current at rated voltage that the molded case switch will withstand without damage when protected by a circuit breaker with an equal continuous current rating.

**Thermal-Magnetic Circuit Breakers for Mining Applications**

These circuit breakers with the properly selected trip range provide protection for trailing cables in compliance with the Federal Register for Mining Applications.

The thermal-magnetic circuit breakers listed below have thermally-responsive trip elements in addition to adjustable instantaneous trip mechanisms. They allow for independent selection of thermal and magnetic trip characteristics. See selection chart below. For Mag-Gard® instantaneous trip magnetic-only circuit breakers refer to Digest.

**Table 11.15: Circuit Breakers for Mining Applications**

Adjustable Magnetic Trip Range★		Cat. No.	\$ Price
Low	High		
400 A	800 A	KAL3608021T	2600.00
		KAL3609021T	2600.00
		KAL3610021T	2600.00
		KAL3611021T	2600.00
		KAL3612521T	2600.00
		KAL3615021T	2600.00
		KAL3617521T	2600.00
500 A	1000 A	KAL3620021T	2600.00
		KAL3610022T	2600.00
		KAL3611022T	2600.00
		KAL3612522T	2600.00
		KAL3615022T	2600.00
		KAL3617522T	2600.00
		KAL3620022T	2600.00
625 A	1250 A	KAL3622522T	2600.00
		KAL3625022T	2600.00
		KAL3612525T	2600.00
		KAL3615025T	2600.00
		KAL3617525T	2600.00
		KAL3620025T	2600.00
750 A	1500 A	KAL3622525T	2600.00
		KAL3625025T	2600.00
		KAL3615026T	2600.00
		KAL3617526T	2600.00
		KAL3620026T	2600.00
1125 A	2250 A	KAL3622526T	2600.00
		KAL3625026T	2600.00
		KAL3622531T	2600.00
		KAL3625031T	2600.00
1250 A	2500 A	KAL3625032T	2600.00

★ Magnetic trip setting tolerances are -20% and +30% from nominal values shown.

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**11 OBSOLETE CIRCUIT BREAKERS**

**Mag-Gard® Motor Circuit Protector**

Instantaneous trip magnetic only circuit breakers have a single adjustment which simultaneously sets the magnetic trip level of each individual pole. Mag-Gard circuit breakers comply with NEC® requirements for providing motor circuit protection when installed as part of a UL Listed combination controller having motor overload protection. Interrupting ratings are established for these UL Recognized Components only when they are used in combination with motor starters with properly sized overload relays and contactors.

Mag-Gard circuit breakers will accept the same lugs and accessories as equivalent thermal-magnetic circuit breakers. Mag-Gard circuit breakers are available with I-Line construction. H-construction Mag-Gard circuit breakers are also available.

**Table 11.16: Magnetic Only 3–1200 A 600 Vac, 50/60 Hz**

Ampere Rating	Adjustable▲ Trip Range	3P only		
		Cat. No.	\$ Price	
KAL	150 A	750–1500 A	KAL3615026M	
	250 A	400–800 A	KAL3625021M	
		500–1000 A	KAL3625022M	
		625–1250 A	KAL3625025M	
		750–1500 A	KAL3625026M	
		875–1750 A	KAL3625029M	
		1000–2000 A	KAL3625030M	
		1125–2250 A	KAL3625031M	
		1250–2500 A	KAL3625032M	
		1500–3000 A	KAL3625033M■	

**For pricing contact your local Schneider Electric distributor.**

▲ UL magnetic trip setting tolerances are -20%/+30% from the nominal values shown.  
■ Not UL Recognized.



Adjustable instantaneous-trip circuit breakers are intended for use in combination with motor starters with overload relays for the protection of motor circuits from short circuits. Other specific applications include rectifiers and resistance welders. These circuit breakers contain a magnetic trip element in each pole with the trip point adjustable from the front. Interrupting ratings are determined by testing the instantaneous-trip circuit breakers in combination with a contactor and overload relay.

Select instantaneous-trip circuit breakers as follows:

1. Use selection table for motors, other than NEMA Design E, with locked-rotor indicating code letters per NEC® Table 430.7 (b) as follows:

Horsepower	Motor Code Letters
1/2 or less	A–L
3/4 to 1-1/2	A–K
2 to 3	A–J
5 to 25	A–H
30 to 125	A–G
150 or more	A–F

For other motors order a special thermal-magnetic circuit breaker with magnetic trip settings for the specific motor— specify motor horsepower, voltage, frequency, full-load current and code letter or locked rotor current.

2. Determine motor hp rating from the motor nameplate.
3. Refer to the table at right and select an instantaneous-trip circuit breaker with an Ampere rating recommended for the hp and voltage involved.
4. Select an adjustable trip setting of at least 800%, not to exceed 1300%, of the motor full-load Amperes. (FLA) for other than Design E motors. For Design E motors, select an adjustable trip setting of at least 1100% not to exceed 1700% of FLA.
5. The NEC 1300% maximum setting may be inadequate for instantaneous-trip circuit breakers to withstand current surges typical of the magnetization current of autotransformer type reduced voltage starters, or open transition wye-delta starters during transfer from "start" to "run," constant hp multi-speed motors, and motors labeled "high efficiency." Select thermal-magnetic circuit breakers from Digest page 7-32 for those applications.
6. Part-winding motors, per NEC® 430.3, should have two circuit breakers selected from the above at not more than one half the allowable trip setting for the horsepower rating. The two circuit breakers should operate simultaneously as a disconnecting means per NEC 430.103.

**Table 11.17: Adjustable Instantaneous-Trip Circuit Breakers for Single Motor Circuit Protection**

Hp Ratings of Induction Type Squirrel-Cage and Wound Rotor Motors				Full Load Amperes▲	Mag-Gard Circuit Breaker Cat. No.	Magnetic Trip Settings ■	
3Ø 60 Hz ac						MIN	MAX
200 V	230 V	460 V	575 V				
30				92	KAL3625025M	700%	1400%
		75		96	KAL3625025M	700%	1300%
			100	99	KAL3625025M	600%	1300%
	40			104	KAL3625026M	700%	1400%
40				120	KAL3625029M	700%	1500%
		100		124	KAL3625029M	700%	1400%
			125	125	KAL3625029M	700%	1400%
	50			130	KAL3625029M	700%	1300%
			150	144	KAL3625030M	700%	1400%
50				150	KAL3625030M	700%	1300%
	60			154	KAL3625031M	700%	1500%
		125		156	KAL3625031M	700%	1400%
60				177.1	KAL3625032M	700%	1400%
		150		180	KAL3625032M	700%	1400%
	75		200	192	KAL3625032M	700%	1300%

▲ Motor full-load currents are taken from NEC Table 430.150. Select wire and circuit breakers on basis of horsepower rather than nameplate full-load current per NEC 430.6 (A) for general motor applications. Do not use these values to select overload relay thermal units. See Digest Section 15 for selection of thermal units when actual full load current is not known. The voltages listed are rated motor voltages. Corresponding nominal system voltages are 200 to 208, 220 to 240, 440 to 480 and 550 to 600 volts.  
■ Only MIN and MAX settings are shown, intermediate settings are available on all circuit breakers.

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For use on vessels over 65 ft. (19.8) in length  
Para utilizarse en embarcaciones mayores a 65 pies (19,8) de longitud  
À utiliser sur des navires ayant plus de 65 pi (19,8) de long

**UL Marine Listed Circuit Breakers**

A standard for molded case circuit breakers which are intended to be installed and used aboard a boat or vessel is included in Supplement SA to UL 489, "Standard for Molded Case Circuit Breakers and Circuit Breaker Enclosures" (also referred to as UL product category DKTY). This UL Standard was established in accordance with U.S. Coast Guard regulations, applicable American Boat and Yacht Council Inc. publications, and NFPA® 302 "Standard for Motor Craft (Pleasure and Commercial)". In order to be UL Listed for marine use, circuit breakers must not use aluminum or aluminum alloys for terminal connections and must be calibrated at an ambient temperature of 40 °C. Standard circuit breakers should not be specified or used in place of marine circuit breakers.

The following table lists those circuit breakers which are UL Marine Listed for use on vessels over 65 ft. (19.8 m) in length. (PowerPact H and J-frame circuit breakers can also be used in vessels under 65 ft. [19.8 m] in length.)

**Table 11.18: Circuit Breakers for Marine Applications**

Cat. No. Prefix	Poles	Ampere Rating	Application	Cat. No.	\$ Price
FC, FCL	2, 3	15–100 A	For use only on vessels over 65 feet (19.8 m) in length.	Add the number "9" after the catalog number prefix of the standard circuit breaker catalog number. Example: Standard FAL36100 Marine FAL936100	There is a 20% adder to the price of the equivalent standard circuit breaker. All marine circuit breakers are supplied with copper lugs.
KA, KAL	2, 3	70–250 A			
KH, KHL	2, 3	70–250 A			
KC, KCL	2, 3	110–250 A			

**UL Listed 500 Vdc Circuit Breakers**

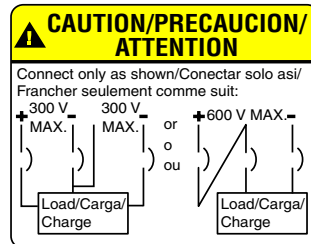
The UL Listed thermal-magnetic molded case circuit breakers shown below are specifically designed for use on ungrounded dc systems having a maximum short-circuit voltage of 500 Vdc or a maximum floating (unloaded) voltage of 600 Vdc. The circuit breakers are suitable for use only with UPS (uninterruptable power supplies) and ungrounded systems.

This two-level voltage rating allows these circuit breakers to be applied to battery sources having a short-circuit availability of 20,000 amperes for FH, KH, LH, and MH circuit breakers and 25,000 amperes for PAF circuit breakers at 500 Vdc.

FH, KH, LH and MH circuit breakers are provided with an adjustable magnetic trip that is readily accessible by means of a single adjustment on the face of the circuit breaker. PAF circuit breakers have a fixed magnetic trip range.

These circuit breakers are UL Listed for the interrupting ratings shown only if applied with three poles connected in series (series connection is external to circuit breaker). See diagram below.

**NOTE:** Due to external series connection, I-Line® circuit breakers are not available for this application.



Source = 600 Vdc max. (floating)  
500 Vdc max. (loaded)

**For pricing contact your local Schneider Electric distributor.**

**Table 11.19: DC Molded Case Circuit Breakers**

Ampere Rating	Circuit Breaker Cat. No.	Adjustable Magnetic Trip Range DC Amperes ▲		Interrupting Rating @ 500 Vdc	\$ Price
		Low	High		
125 A	KHL3612517DC	350	700	20 kAIR	
150 A	KHL3615017DC	350	700		
175 A	KHL3617521DC	400	800		
200 A	KHL3620022DC	500	1000		
225 A	KHL3622522DC	500	1000		
250 A	KHL3625025DC	625	1250		

▲ Magnetic trip tolerances are -20%/+30% from the nominal values shown.

Accessories . . . . . Page 7-36 and Supplemental Digest  
Optional Lugs . . . . . Page 7-39 and Supplemental Digest  
Dimensions . . . . . Pages 7-54 and 7-55  
Enclosures . . . . . Pages 7-56–7-58

**11 OBSOLETE CIRCUIT BREAKERS**



2P QO



2P QOB



2P Q1

**Replacing Obsolescent Q1 and Q1B Circuit Breakers In NQO, NQOB and NQOD Panelboards**

Q1 and Q1B circuit breakers have been replaced by QO and QOB circuit breakers.

Table 1 below is used for replacing 1P, 2P or 3P Q1 and Q1B circuit breakers with QO and QOB branch circuit breakers in NQO, NQOB and NQOD panelboards.

Table 2 below is used for replacing Q1 and Q1B main circuit breakers in NQO and NQOB panelboards.

**Table 11.20: Replacing Q1 and Q1B Circuit Breakers with QO and QOB Branch Circuit Breakers**

Panelboard Type	Branch Circuit Breaker		Mounting Assembly Required ♦	\$ Price
	Obsolete	Available		
NQOB	Q1B	QOB	SK5668	93.00
NQOD		QO	SKNQOD225 ■	75.00
NQOD		QOB	SKNQOD225 ■	75.00

**Table 11.21: Replacing Q1 and Q1B Main Circuit Breakers in NQO and NQOB Panelboards**

Panelboard Type	Main Circuit Breaker		Mounting Assembly Required ♦	\$ Price	Retaining Kit Required	\$ Price
	Obsolete	Available				
NQOB	Q1B	QOB	SK5668	93.00	—	—

▲ Mounting assembly SK5669 is used to mount both Q1 and QO circuit breakers. Not required for replacement purposes.

■ 225 A maximum. For 400–600 ampere circuit breaker mounting assembly, see Class 1630 Service Bulletin.

♦ Discount Schedule PE1A.

**Branch Circuit Breakers and Mounting Assemblies for ML Panelboards**

Replacement circuit breakers for ML panelboards are determined by the manufacture date of the panel and the panel depth. (See chart below)

**Table 11.22: Replacement Circuit Breakers in ML Panelboards**

Manufacture Date	Panel Depth		Availability of Replacement Circuit Breakers
	in.	mm	
1948–1956	8.63	219	No Replacements Available
1958–1961	10.00	254	No Replacements Available
1962–1968	10.63	270	Refer to Tables Below

The tables below are used for replacing or adding circuit breakers to 10-5/8 inch deep ML panelboards manufactured from 1962–1968 and for switchboards manufactured from 1962–1968.

**Table 11.23: Replacement of Existing Circuit Breakers**

Existing Circuit Breaker	Ampere Rating	Mounting Height		Cat. No. Prefix	Replacement Circuit Breaker	Mounting Assembly Required	Poles Required	Single or Twin (Mounting Assembly)	Mounting Assembly \$ Price
		in.	mm						
ML-1	15–100 A	4.50	114	989 or 999	FAL	SK4515★	3P	Twin	1637.00
ML-3	100–225 A	6.00	152	997	KAL	SK4516★	3P	Twin	1784.00
LA (W)	225–400	8.25	210	LA	LAL	SK4517	3P	Single	2135.00
MA (W)	125–1000 A	8.25	210	MA	MAL	SK4578	3P	Single	2783.00
FAL	15–100 A	4.50	114	FAL	FAL	No Mounting Assembly Required	3P	Twin	N/A
KAL	70–250 A	4.50	114	KAL	KAL		3P	Twin	
LAL	125–400 A	6.00	152	LAL	LAL		3P	Single	
MAL	300–1000 A	9.00	229	MAL	MAL		3P	Single	
MAL	125–250 A	9.00	229	MAL	LAL	SK4517	3P	Single	2135.00

**Table 11.24: Adding New Circuit Breakers**

Cat. No. Prefix	Ampere Rating	Mounting Assembly Required	Mounting Height		Poles Required	Single or Twin (Mounting Assembly)	Mounting Assembly \$ Price
			in.	mm			
FAL	15–100 A	SK4515	4.50	114	3P	Twin	1637.00
KAL	70–250 A	SK4516	4.50	114	3P	Twin	1784.00
LAL	125–400 A	SK4517	6.00	152	3P	Single	2135.00
MAL	300–1000 A	SK4578	9.00	229	3P	Single	2783.00

★ Mounting assemblies for twin-mounted circuit breakers will only accept the same family and configuration of circuit breakers, i.e., FAL and FAL.

11 OBSOLETE CIRCUIT BREAKERS

Replacement rating plugs for circuit breakers manufactured before Micrologic®.

**Table 11.25: Replacement Rating Plugs for Pre-Micrologic Circuit Breakers**

Circuit Breakers Manufactured Before Micrologic	Frame Size	Ampere Rating	Cat. No.▲	\$ Price	
ME	225 A	100 A	ME2100	2997.00	
		110 A	ME2110		
		125 A	ME2125		
		150 A	ME2150		
		175 A	ME2175		
		250 A	ME4250		
	400 A	350 A	ME4350	2997.00	
		450 A	ME8450		
	800 A	500 A	ME8500	2997.00	
		700 A	ME8700		
	PE-G/PEC-G Built before June 1, 1982 and all PE/PEC	1200 A	600 A	PE120600	2997.00
			700 A	PE120700	
800 A			PE120800		
900 A			PE120900		
1000 A			PE121000		
1200 A			PE121200		
2000 A	1000 A	PE161000	2997.00		
	1200 A	PE161200			
	1400 A	PE161400			
	1000 A	PE161000			
	1200 A	PE161200			
	1400 A	PE161400			
PE-G/PEC-G Built after June 1, 1982	1200 A	600 A	PEG120600	2997.00	
		700 A	PEG120700		
		800 A	PEG120800		
		1000 A	PEG121000		
		1200 A	PEG121200		
		1000 A	PEG161000		2997.00
1200 A	PEG161200				
1400 A	PEG161400				
2000 A	1000 A	PEG161000	2997.00		
	1200 A	PEG161200			
	1400 A	PEG161400			
	1800 A	PEG201800			
2000 A	PEG202000				

▲ Contact your local sales office for availability.

**Table 11.26: Interchangeable Rating Plug Kits for ME, NE, PE and SE Circuit Breakers with Full-Function Micrologic Trip System Manufactured Between December 1989 and September 1992**

Old Cat. No.	New Cat. No.■	Multiplier Value	\$ Price
RP040	ARP040	0.400	297.00
RP050	ARP050	0.500	
RP056	ARP056	0.563	
RP058	ARP058	0.583	297.00
RP060	ARP060	0.600	
RP063	ARP063	0.625	
RP067	ARP067	0.667	297.00
RP070	ARP070	0.700	
RP075	ARP075	0.750	
RP080	ARP080	0.800	297.00
RP083	ARP083	0.833	
RP088	ARP088	0.875	
RP090	ARP090	0.900	297.00
RP100	ARP100	1.000	

■ Discount Schedule DE2

**Table 11.27: Replacement Rating Plugs for Micrologic Circuit Breakers**

Circuit Breaker	Frame Size	Ampere Rating	Cat. No.♦	\$ Price
Micrologic ME Series 3	225 A	100 A	ME2100RP	1332.00
		110 A	ME2110RP	
		150 A	ME2150RP	
		175 A	ME2175RP	
	400 A	250 A	ME4250RP	1332.00
		800 A	500 A	
Micrologic NE Series 1	1200 A	450 A	ME8450RP	1332.00
		600 A	NE120600RP	
		630 A	NE120630RP	
		700 A	NE120700RP	
		800 A	NE120800RP	
		900 A	NE120900RP	
Micrologic PE Series 4	1200 A	1000 A	PE121000RP	1332.00
		600 A	PE120600RP	
		700 A	PE120700RP	
		1000 A	PE121000RP	
	1600 A	1200 A	PE121200RP	1332.00
		1000 A	PE161000RP	
Micrologic SE Series 2	200 A	1000 A	PE161200RP	1332.00
		1200 A	PE161400RP	
		1400 A	PE201800RP	
		1800 A	PE202000RP	
	400 A	200 A	S9020100RP	1332.00
		250 A	S9020125RP	
800 A	125 A	S9020150RP	1332.00	
	150 A	S9020175RP		
	175 A	S9020200RP		
	200 A	S9040200RP		
	250 A	S9040250RP		
	300 A	S9040300RP		
1200 A	350 A	S9040350RP	1332.00	
	450 A	S9080450RP		
	500 A	S9080500RP		
	700 A	S9080700RP		
	800 A	S9120800RP		
	1000 A	S9121000RP		
1600 A	1200 A	S9121200RP	1332.00	
	1000 A	S9161600RP		
	2000 A	S9202000RP		
	2000 A	S9202000RP		

♦ Contact your nearest local sales office for availability.



ME Micrologic Circuit Breakers



ME Circuit Breakers Manufactured before Micrologic



PE Micrologic Circuit Breakers







PE Circuit Breakers Manufactured before Micrologic



SE Micrologic Circuit Breakers

EH/EHB circuit breakers are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local Sales Office for product availability.

Table 11.28: E Frame—100 A, Thermal Magnetic (480Y/277 Vac)

Amp Rating	1P 277 Vac—14 kA 120 Vac—65 kA		2P 480Y/277 Vac—14 kA 120/240 Vac—65 kA		3P 480Y/277 Vac—14 kA 240 Vac—65 kA		Wire Size (AWG)		Wire Temp.		
					Requires 1 Space	Requires 1 Space					Requires 2 Spaces
	Plug-On		Bolt-On		Bolt-On		Bolt-On		Al	Cu	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price			
<b>EH/EHB Circuit Breakers</b>											
15 A	EH14015 ▲	Not Available	EHB14015 ▲	207.00	EHB24015	527.00	EHB34015	921.00	—	(2) 14–10	60/75 °C
	—	—	—	—	—	—	EHB340151042	1676.00	—	(2) 14–10	60/75 °C
	—	—	EHB140151082	962.00	—	—	EHB340151082	1676.00	—	(2) 14–10	60/75 °C
20 A	EH14020 ▲	Not Available	EHB14020 ▲	207.00	EHB24020	527.00	EHB34020	921.00	—	(2) 14–10	60/75 °C
	—	—	—	—	—	—	EHB340201042	1676.00	—	(2) 14–10	60/75 °C
	—	—	EHB140201082	962.00	EHB240201082	1281.00	EHB340201082	1676.00	—	(2) 14–10	60/75 °C
	—	—	—	—	EHB240201212	839.00	EHB340201212	1233.00	—	(2) 14–10	60/75 °C
25 A	EH14025	Not Available	EHB14025	Not Available	EHB24025	Not Available	EHB34025	Not Available	12–8	14–8	60/75 °C
	EH14030	Not Available	EHB14030	207.00	EHB24030	527.00	EHB34030	921.00	12–8	14–8	60/75 °C
30 A	—	—	EHB140301082	962.00	EHB240301042	1281.00	EHB340301082	1676.00	12–8	14–8	60/75 °C
	—	—	—	—	EHB240301082	1218.00	EHB340301212	1233.00	12–8	14–8	60/75 °C
	—	—	—	—	—	—	EHB3403035	1106.00	12–8	14–8	60/75 °C
	—	—	—	—	—	—	EHB3403035	1106.00	12–8	14–8	60/75 °C
35 A	EH14035	Not Available	EHB14035	207.00	EHB24035	527.00	EHB34035	921.00	12–2	14–2	75 °C
	EH14040	Not Available	EHB14040	207.00	EHB24040	527.00	EHB34040	921.00	12–2	14–2	75 °C
40 A	—	—	—	—	—	—	EHB340401042	1676.00	12–2	14–2	75 °C
	—	—	—	—	—	—	EHB340401212	1233.00	12–2	14–2	75 °C
45 A	EH14045	Not Available	EHB14045	207.00	EHB24045	527.00	EHB34045	921.00	12–2	14–2	75 °C
	EH14050	Not Available	EHB14050	207.00	EHB24050	527.00	EHB34050	921.00	12–2	14–2	75 °C
50 A	—	—	—	—	—	—	EHB340501042	1676.00	12–2	14–2	75 °C
	—	—	—	—	—	—	EHB340501082	1676.00	12–2	14–2	75 °C
	—	—	—	—	—	—	EHB340501212	1233.00	12–2	14–2	75 °C
	—	—	—	—	—	—	EHB340501212	1233.00	12–2	14–2	75 °C
60 A	EH14060	Not Available	EHB14060	207.00	EHB24060	527.00	EHB34060	921.00	12–2	14–2	75 °C
	—	—	—	—	—	—	EHB340601042	1592.00	12–2	14–2	75 °C
—	—	—	—	—	—	EHB340601212	1148.00	12–2	14–2	75 °C	
70 A	—	—	—	—	EHB24070 ■	Not Available	EHB34070 ■	Not Available	4–2/0	4–2/0	75 °C
80 A	—	—	—	—	EHB24080 ■	Not Available	EHB34080 ■	Not Available	4–2/0	4–2/0	75 °C
90 A	—	—	—	—	EHB24090 ■	Not Available	EHB34090 ■	Not Available	4–2/0	4–2/0	75 °C
100 A	—	—	—	—	EHB24100 ■	1040.00	EHB34100 ■	Not Available	4–2/0	4–2/0	75 °C
100 A	—	—	—	—	EHB241001082	1794.00	EHB34100 ■	Not Available	4–2/0	4–2/0	75 °C
<b>EH/EHB HID Circuit Breakers — For Use on High Intensity Discharge Lighting Systems</b>											
15 A	EH14015HID ▲	Not Available	EHB14015HID ▲	Not Available	EHB24015HID	561.00	EHB34015HID	Not Available	—	(2) 14–10	60/75 °C
20 A	EH14020HID ▲	204.00	EHB14020HID ▲	234.00	EHB24020HID	561.00	EHB34020HID	972.00	—	(2) 14–10	60/75 °C
25 A	EH14025HID	Not Available	EHB14025HID	234.00	EHB24025HID	Not Available	EHB34025HID	Not Available	12–8	14–8	60/75 °C
30 A	EH14030HID	Not Available	EHB14030HID	234.00	EHB24030HID	Not Available	EHB34030HID	972.00	12–8	14–8	60/75 °C

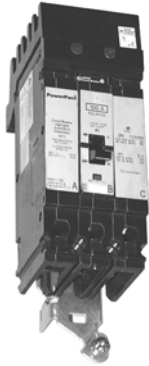
▲ UL Listed as SWD (switching duty) rated.

■ For use only in Series 3 or Series E1 panelboards. Contact your nearest local sales office for use in earlier series panelboards

Table 11.29: Handle Accessories

Accessory	Circuit Breaker Prefix	No. of Poles	Cat. No.	\$ Price
Handle Padlock Attachment (locks ON or OFF)	EH (15–100 A)	1, 2, 3	HPAEH	11.40

FJ 3-pole circuit breakers are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local Sales Office for product availability. FD and FG circuit breakers are obsolete and are no longer available.



FJ 3P  
3 in. (76 mm) Mounting Height

**Table 11.30: FJ Powerpact®—100 A, Thermal-Magnetic (480Y/277 Vac)**

Cont. Current Rating @ 40°C	AC Magnetic Trip Settings		J Interrupting		Terminal Wire Range
	Hold	Trip	Cat. No.	\$ Price	
<b>3P, 480Y/277 Vac</b>					
15 A	250 A	500 A	FJA34015	2318.00	AL30FD 12–6 AWG Al or 14–6 AWG Cu
20 A	250 A	500 A	FJA34020		
25 A	250 A	500 A	FJA34025		
30 A	250 A	500 A	FJA34030		
35 A	550 A	1100 A	FJA34035	2318.00	AL100FD 12–2/0 AWG Al or 14–2/0 AWG Cu
40 A	550 A	1100 A	FJA34040		
45 A	550 A	1100 A	FJA34045		
50 A	550 A	1100 A	FJA34050		
60 A	550 A	1100 A	FJA34060		
70 A	550 A	1100 A	FJA34070	2852.00	
80 A	550 A	1800 A	FJA34080		
90 A	550 A	1800 A	FJA34090		
100 A	550 A	1800 A	FJA34100		

**Table 11.31: Mechanical Lug Kit Information**

Circuit Breaker Application				Number of Wires Per Lug and Wire Range▲	Kit Cat. No.	Lugs Per Kit	\$ Price Per Kit★
Standard	Ampere Rating	Optional	Ampere Rating				
<b>Al Lugs for Use with Al or Cu Wire</b>							
FJ	15–30 A	—	—	(1) 12–6 AWG Al or (1) 14–6 AWG Cu	AL30FD	3	41.30
FJ	35–125 A	FJ	15–30 A	(1) 12–2/0 AWG Al or (1) 14–2/0 AWG Cu	AL100FD	3	41.30
<b>Cu Lugs for Use with Cu Wire Only</b>							
—	—	FJ	15–125 A	(1) 14–1/0 AWG Cu	CU100FD	3	41.30

**Table 11.32: UL Listed Field-installable Compression Lug Kits**

Circuit Breaker Type	System Range▲	Dimension A (in.)	Max. Lugs Per Terminal	Kit Cat. No.	Lug Qty. Per Kit	\$ Price Per Kit★
<b>Aluminum Compression Lug Kits</b>						
FJ	8–1/0 AWG	1.375	1	VC100FD	3	102.00
<b>Copper Compression Lug Kits</b>						
FJ	6–1/0 AWG	1.375	1	CVC100FD	3	102.00

**Table 11.33: Electrical Accessory Package for FJ Circuit Breakers**  
Add suffix to catalog number (ie. FJA34015 becomes FJA34015AABASA)

Accessory Package■	Suffix	\$ Price
Auxiliary Switch/Alarm Switch/Shunt Trip Package	AABASA	1067.00

**Table 11.34: Terminal Nut Insert Kit**

Circuit Breaker Type	Qty. per Kit	Cat. No.	\$ Price★
FJ	3	TIKFD	17.40

**Table 11.35: Handle Accessories**

Circuit Breaker Type	No. of Poles	Cat. No.	\$ Price★
<b>Handle Padlock Attachment (locks ON or OFF)</b>			
FJ	1, 2 or 3	HPAFD	25.50

Phase Option No.	Phase Connection	3P
Standard ♦	ABC	FJA34020
6	CBA	FJA340206

- ▲ Unless otherwise specified, wire sizes apply to both aluminum and copper conductors.
- Accessory package takes an additional pole space.
- ♦ The absence of a phase option number after a 3-pole catalog number will result in an ABC phase connection.
- ★ Discount Schedule DE2.

**Table 11.36: Interrupting Ratings (kA)**

Voltage	J
480Y/277	65

QE circuit breakers are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local Sales Office for product availability.

**Table 11.37: Branch Circuit Breakers**

Branch Device			
System Type	Branch Circuit Breaker		
	Ampere Rating	Cat. No.	\$ Price
<b>1Ø IN – 1Ø OUT</b>			
or			
<b>3Ø IN – 1Ø3W OUT</b>			
200 A Max.	70 A	QE270VH	438.00
	80 A	QE280VH	489.00
	90 A	QE290VH	489.00
	100 A	QE2100VH	489.00
	125 A	QE2125VH	Not Available
	150 A	QE2150VH	1158.00
	175 A	QE2175VH	Not Available
	200 A	QE2200VH	Not Available
<b>3Ø IN 3Ø OUT</b>			
200 A Max.	70 A	QE370VH	489.00
	80 A	QE380VH	Not Available
	90 A	QE390VH	Not Available
	100 A	QE3100VH	Not Available
	125 A	QE3125VH	Not Available
	150 A	QE3150VH	Not Available
	175 A	QE3175VH	Not Available
	200 A	QE3200VH	Not Available

11 OBSOLETE CIRCUIT BREAKERS

**Powerpact KD and KG circuit breakers are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local Sales Office for product availability.**



KDL and KGL  
Circuit Breaker  
3P  
100–250 A

**Table 11.38: Powerpact® K Frame—250 A, Thermal-Magnetic (240 Vac)**

Continuous Current Rating @ 40°C	AC Magnetic Trip Settings		D Interrupting Level		G Interrupting Level		Terminal Wire Range
	Hold	Trip	Cat. No.	\$ Price	Cat. No.	\$ Price	
<b>2P, 240 Vac</b>							
100 A	1100 A	1700 A	KDL22100	Not Available	KGL22100	Not Available	AL250KD 6 AWG–350 kcmil Al or Cu
110 A	1100 A	1700 A	KDL22110	Not Available	KGL22110	Not Available	
125 A	1100 A	1700 A	KDL22125	Not Available	KGL22125	Not Available	
150 A	1100 A	1700 A	KDL22150	<b>1362.00</b>	KGL22150	Not Available	
175 A	1400 A	2400 A	KDL22175	Not Available	KGL22175	Not Available	
200 A	1400 A	2400 A	KDL22200	Not Available	KGL22200	<b>5760.00</b>	
225 A	1400 A	2400 A	KDL22225	Not Available	KGL22225	Not Available	
250 A	1400 A	2400 A	KDL22250	Not Available	KGL22250	Not Available	
<b>3P, 240 Vac</b>							
100 A	1100 A	1700 A	KDL32100	<b>2123.00</b>	KGL32100	Not Available	AL250KD 6 AWG–350 kcmil Al or Cu
110 A	1100 A	1700 A	KDL32110	Not Available	KGL32110	Not Available	
125 A	1100 A	1700 A	KDL32125	<b>2123.00</b>	KGL32125	Not Available	
150 A	1100 A	1700 A	KDL32150	<b>2123.00</b>	KGL32150	Not Available	
175 A	1400 A	2400 A	KDL32175	Not Available	KGL32175	Not Available	
200 A	1400 A	2400 A	KDL32200	Not Available	KGL32200	Not Available	
225 A	1400 A	2400 A	KDL32225	<b>2123.00</b>	KGL32225	Not Available	
250 A	1400 A	2400 A	KDL32250	Not Available	KGL32250	Not Available	

**Table 11.39: Mechanical Lug Kit Information**

Kit Catalog Number	Circuit Breaker Application				Number of Wires Per Lug and Wire Range	Torque	Lugs Per Kit	\$ Price
	Standard	Ampere Rating	Optional	Ampere Rating				
<b>Al Lugs for Use with Al or Cu Wire</b>								
AL250KD	KDL, KGL	100–250 A	—	—	(1) 6 AWG–350 kcmil	300 lb-in (34 N•m)	3	Not Available
<b>Cu Lugs for Use with Cu Wire Only</b>								
CU250KD	—	—	KDL, KGL	100–250	(1) 6 AWG–350 kcmil	300 lb-in (34 N•m)	3	<b>134.00</b>

**Table 11.40: Handle Accessories**

Circuit Breaker Type	Cat. No.	\$ Price
<b>Handle Padlock Attachment (locks ON or OFF)</b>		
KDL, KGL	HPAKD	Not Available

**Table 11.41: Interrupting Ratings (kA)**

	KDL	KGL
240 V	25	65
480 V	—	—
600 V	—	—

**11 OBSOLETE CIRCUIT BREAKERS**

IL/ILL circuit breakers and adapter kit for rotary handle operator products are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local Sales Office for product availability.



IL Circuit Breaker  
300-400 A

**Table 11.42: Current Limiting I-Limiter® (400 A, 480 Vac)**

Ampere Rating	AC Magnetic Trip Setting		3P I-Line Circuit Breaker		3P Individually-Mounted Circuit Breaker	
	Low	High	Cat. No.	\$ Price■	Cat. No.	\$ Price
400 A	1500 A	4000 A	IL344001021	36630.00	ILL34400	Not Available

**Table 11.43: Mechanical Lug Kit Information**

Kit Cat. No.	Circuit Breaker	Ampere Rating	Number of Wires Per Lug and Wire Range△	Lugs Per Kit	\$ Price
CU400IL40	IL	250-400 A	(2) 6-4/0 AWG Cu	1	Not Available

**Table 11.44: Compression Lug Kit Information**

Kit Cat. No.	Circuit Breaker	Number of Lugs Per Terminal and Wire Range▲	Lugs Per Kit	\$ Price
VC400LA35	IL	(2) 250-350 kcmil	2	195.00
VC400LA3	IL	(2) 4 AWG-300 kcmil	1	202.00
VC400LA5	IL	(1) 2/0 AWG-500 kcmil	1	95.00
VC400LA7	IL	(1) 500-750 kcmil Al or 500 kcmil Cu	2	95.00
CVC400LA3	IL	(2) 4 AWG-300 kcmil Cu	2	195.00
CVC400IL3	IL	(2) 2/0 AWG-300 kcmil Cu	2	Not Available
CVC400LA5	IL	(1) 250-500 kcmil Cu	1	95.00
CVC400IL5	IL	(1) 250-500 kcmil Cu	1	Not Available

- ▲ Unless otherwise specified, wire sizes apply to both aluminum and copper conductors.
- Discount Schedule DE5A.



NHL circuit breakers and related accessory products are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local Sales Office for product availability.



NHL Circuit Breaker  
800–1200 A

**Table 11.45: NHL Circuit Breaker (1200 A, 480 Vac)**

Ampere Rating	AC Magnetic Trip Settings Amperes		2P		3P		Standard Lug Kit Wire Range
	Low	High	Cat. No.	\$ Price	Cat. No.	\$ Price	
800 A	4000 A	8000 A	—	—	NHF368001021	20795.00	AL1200NA (4) 350–750-kcmil
1000 A	5000 A	10000 A	—	—	NHF3610001021	24486.00	
1200 A	5000 A	10000 A	—	—	NHF361200	27903.00	
1200 A	5000 A	10000 A	—	—	NHF3612001021	28731.00	
800 A	4000 A	8000 A	—	—	NHL36800	19965.00	
1000 A	5000 A	10000 A	NHL261000	21123.00	NHL361000	23658.00	
1000 A	5000 A	10000 A	—	—	NHL3610001021	24486.00	
1200 A	5000 A	10000 A	NHL261200	25173.00	NHL361200	27903.00	
1200 A	5000 A	10000 A	—	—	NHL3612001021	28731.00	

**Table 11.46: Mechanical Lug Kit**

Kit Cat. No.	Circuit Breaker	Ampere Rating	Number of Wires Per Lug and Wire Range▲	Lugs Per Kit	\$ Price
AL1200NA	NH	600–1200	(4) 350–750 kcmil	1	290.00

**Table 11.47: Compression Lug Kit**

Kit Cat. No.	Circuit Breaker	Number of Lugs Per Terminal and Wire Range▲	Lugs Per Kit	\$ Price
VC1200NA5	NH	(1) 2/0 AWG–500 kcmil	1	713.00
VC1200NA7	NH	(1) 500–750 kcmil Al or 500 kcmil Cu	1	776.00

▲ Unless otherwise specified, wire sizes apply to both aluminum and copper conductors.

**Table 11.48: Mechanical Accessories**

Cat. No.	Circuit Breaker	Description	No. of Poles	\$ Price
HPANA■	NH	Handle Padlock Attachment	2, 3	36.50
NAHEX	NH	Handle Extension	2, 3	228.00

■ Use with NAHEX handle extension.

**Table 11.49: Control Wire Terminations**

Cat. No.	Standard Package Quantity	\$ Price per Lug
AL1200NAT	1	276.00

SE circuit breakers and related accessories are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local Sales Office for product availability.

**Table 11.50: SE Circuit Breaker**

Sensor Size	Ampere Rating	Rating Plug Installed	Fixed-Mounted Circuit Breaker			Drawout Circuit Breaker		
			Cat. No.▲■		\$ Price	Cat. No.▲■		\$ Price
			Long-Time Short-Time Instantaneous	Long-Time Short-Time Instantaneous w/Ground Fault ♦		Long-Time Short-Time Instantaneous	Long-Time Short-Time Instantaneous w/Ground Fault ♦	
<b>Standard Interrupting Rating</b>								
1200 A	1200 A	ARP100	SEF361200LSMR	—	46493.00	—	—	—
3000 A	3000 A		SEF363000LS	—	88845.00	SED363000LS	—	105443.00
			—	SEF363000LSG	94695.00	—	SED363000LSG	111294.00
			SEF363000LSMR	—	95942.00	SED363000LSMR	—	112539.00
			—	SEF363000LSGMR	101792.00	—	SED363000LSGMR	118391.00
4000 A	4000 A		SEF364000LSZ	—	141783.00	—	—	—
			SEF364000LSMRZ	—	148880.00	—	—	
			—	SEF364000LSGMRZ	154731.00	—	SED364000LSGMR	181920.00
			—	SEF364000LSAMRZ	154731.00	—	—	—
<b>High Interrupting Rating</b>								
1200 A	1200 A	ARP100	—	SEHF361200LSGMR	59051.00	—	—	—
3000 A	3000 A		SEHF363000LSMR	—	112541.00	—	—	—

- ▲ "MR" (Motor Ready) indicates 120 Vac spring charging motor only already installed. Does not include shunt close or shunt trip option.
- "Z" indicates circuit breaker supplied without terminal connector kit.
- ♦ Substitute (A) in place of (G) for ground-fault alarm (pick-up indication only).

11 OBSOLETE CIRCUIT BREAKERS

SE circuit breakers and related accessories are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your nearest local sales office for product availability.

**Table 11.51: Field-Replaceable Electronic Trip Unit Kits (Replaceable by Field Services Only)▲**

Ampere Rating	Trip Unit Function Cat. No.			\$ Price
	Long-Time Short-Time Instantaneous	Long-Time Short-Time Instantaneous with Ground Fault	Long-Time Short-Time Instantaneous with Ground Fault Alarm	
400 A	—	SETU400LSGB	—	9147.00
800 A	SETU800LSB	—	—	7163.00
800 A	—	SETU800LSGB	—	9147.00
1200 A	SETU1200LSB	—	—	7163.00
1200 A	—	SETU1200LSGB	—	9147.00
1600 A	—	SETU1600LSGB	SETU1600LSAB	9147.00
2500 A	—	SETU2500LSGB	—	9147.00
3000 A	SETU3000LSB	—	—	7163.00
3000 A	—	SETU3000LSGB	SETU3000LSAB	9147.00
4000 A	SETU4000LSB	—	—	7163.00
4000 A	—	SETU4000LSGB	—	9147.00

▲ Used only with SE circuit breaker Series 3B.

**Table 11.52: SE Drawout Cell Keying Kit**

Cell Keying Kit Cat. No.	Frame Size	Cell Key Positions Table					\$ Price
		Drawout Carriage Cell Key Position					
		A	B	C	D	E	
SECK0400	400 A		X			X	Not Available
SECK0800	800 A			X	X		Not Available
SECK1200	1200 A	X	X				212.00
SECK1600	1600 A				X	X	212.00
SECK2000	2000 A	X				X	212.00
SECK2500	2500 A	X				X	212.00
SECK3000	3000 A		X	X			212.00

**Table 11.53: Field-Replaceable Accessory Kits**

Description	Kit Cat. No.	\$ Price	
Spring Charging Motor Replacement Kit	120 Vac 24 Vdc 48 Vdc	S3MOT120AC2 — —	7097.00 — —
	125 Vdc	S3MOT125DC2	8094.00
Shunt Close Replacement Kit	120 Vac	S3SC120AC2	1266.00
	24 Vdc	S3SC024DC2	1266.00
	48 Vdc	S3SC048DC2	1266.00
	125 Vdc	S3SC125DC2	1266.00
Shunt Trip Replacement Kit	120 Vac	S3ST120AC2	1266.00
	24 Vdc	S3ST024DC2	1266.00
	48 Vdc	S3ST048DC2	1266.00
	125 Vdc	S3ST125DC2	1266.00
Undervoltage Trip Replacement Kit	120 Vac	—	—
Auxiliary Switch Replacement Kit	4 ac/dc	S34DCB2	1364.00
	4 ac/dc add on	S34DCT2	1364.00
	4 ac only	S34AC2	809.00
	8 ac only	S38AC2	1611.00
Alarm Switch Replacement Kit	2 ac only	S3AS2	809.00

■ Also field-installable on Series 3 and newer, and for Series 2 ground fault circuit breakers.

**Table 11.54: Field-Installable External Accessory Kits**

Description	Kit Cat. No.	\$ Price
Padlock Attachment	SE2PA	210.00
Close Button Cover	SE1CBC	152.00
Key Interlock Bracket	SE1KI	860.00
Series 1 Primary Injection Test Plug	SEPITK1	209.00
Series 2 Primary Injection Test Plug	SEPITK2	309.00
SE Drawout Crank	SEDC	209.00
Fan Monitoring Switch Kit	SE40FAN	No Charge

◆ Fixed-mounted circuit breakers only. Does not include key interlock.

**Table 11.55: Neutral Current Transformers**

Cat. No.	\$ Price	Sensor	Where Used
SE12NCT	644.00	800	SE, SEH
SE12NCT	644.00	1200	SE, SEH
SE30NCT	644.00	1600	SE, SEH
SE30NCT	644.00	2000	SE, SEH
SE30NCT	644.00	2500	SE, SEH
SE30NCT	644.00	3000	SE, SEH
SE40NCT	644.00	4000	SE, SEH

**Electric Joint Compound**

SE drawout circuit breakers are supplied with factory-applied joint compound on the plug-on connectors. The compound should not be removed because it contributes to the overall performance of the connection.

Whenever one of these units is removed and reinstalled, the joint compound should be reapplied.

PJC 8311 is a two-ounce container of compound specially formulated for the SE drawout connections. This compound MUST BE USED ON SE DRAWOUT CONNECTIONS. No other type of commercially available joint compound should be used.

**Table 11.56: Electric Joint Compound**

Used With	Cat. No.	\$ Price
SED Drawout Circuit Breakers	PJC8311	42.80

11 OBSOLETE CIRCUIT BREAKERS

Compact® CK and C circuit breakers and related accessories are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.

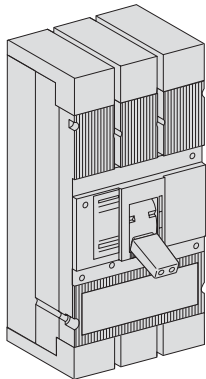
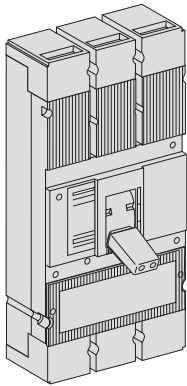


Table 11.57: Compact CK Circuit Breakers and Switches ▲ ★

	Plug Rating (A)	Rating	Connection	Poles	Cat. No.	\$ Price
<b>COMPACT CK Circuit Breaker</b>						
CK1000HL ◆	1000 A	Standard Rated 65 kA at 480 Vac	Bus Bar	3P	CKIXF36100LI	30632.00
CK400HH	400 A	100% Rated 65 kA at 480 Vac			CKHEF36404LI	13415.00
CK800HH	800 A				CKHEF36808L2	18542.00
CK800HH	800 A				CKHEF36808LS	16275.00
CK800HH	800 A				CKHEF36808LI	13415.00
CK1200HH ■	1200 A				CKHEF36121LSERL	26181.00
CK1200HH ■	1200 A	CKHEF36121LIERL	23321.00			
CK800N	800 A	Standard Rated 50 kA at 480 Vac	Cable	4P	CKAXL46808LI	11895.00
<b>COMPACT CK Non-Automatic Molded Case Switch</b>						
CK800NA	800 A	Non-Automatic Switch	Bus Bar	3P	CKAF36008S	7803.00
CK1200NA	1200 A				CKAF36001S	12389.00
Cable Range	800 A terminal	1-2 cables: 2/0 AWG-400 kcmil Cu 1-3 cables: 2/0 AWG-300 kcmil Cu 1-3 cables: 4/0 AWG-400 kcmil Al				
	1200 A terminal	1-4 cables: 3/0 AWG-500 kcmil Cu 1-4 cables: 4/0 AWG-500 kcmil Al 1-3 cables: 250-600 kcmil Cu or Al				

- ▲ STRxxDP, SP and UP trip units allow Long Time adjustment from 0.8 to 1 times plug rating.
- Edgewise rear connectors are mandatory for line and load and are included. Not available for cable connected.
- ◆ 150 kA at 480 Vac.
- ★ Summary of Option:  
F: Fault indicators  
T: Residual-type ground-fault protection  
C: Communication with Digipact®

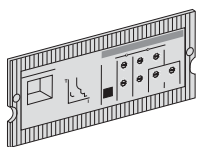
Table 11.58: Compact C801/1001/1251 Circuit Breakers with STR25DE Trip Unit

	Plug Rating	Rating	Connection	Poles	Cat. No.	\$ Price
C1001N	1000 A	50 kA at 380/415 Vac	Bus Bar	3P	CKAXFE36100LI	1322100
C1001H	1000 A	70 kA at 380/415 Vac	Bus Bar	3P	CKHXFE36100LI	15150.00
C1001N	1000 A	50 kA at 380/415 Vac	Cable	3P	CKAXLE36100LI	13940.00
C1251N	1250 A			3P	CKAXLE36125LI	17432.00
C1001H	1000 A	70 kA at 380/415 Vac	Cable	3P	CKHXLE36100LI	15869.00
C1251H	1250 A			3P	CKHXLE36125LI	19367.00
Cable range:	800 A terminal:	1-3 cables: 70-185 mm <sup>2</sup> Cu or Al				
	1250 A terminal:	1-4 cables: 70-240 mm <sup>2</sup> Cu or Al				

Ratings and interrupting ratings: Page 45 of 0600PL9701  
Additional Information: Catalog AC0037/2E, Data Sheet 0628HO9801  
Other termination: ..... Page 11-22  
Other trip units ..... Page 11-21  
Other rating plugs ..... Page 11-21  
Accessories: ..... Page 11-23

11 OBSOLETE CIRCUIT BREAKERS

**Compact® CK and C circuit breakers and related accessories are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.**



**Table 11.59: Other Electronic Trip Units (Replaceable by Field Services only)♦**

	Cat. No.	\$ Price
Long-Time ▲ and Instantaneous Protection		
STR25DP	35400	4701.00
STR25DE	46501■	4701.00
Long-Time ▲, Short-Time and Instantaneous Protection		
STR35SE	46504■	7562.00
Long-Time ▲, Short-Time, Instantaneous Protection and Options		
STR55UP T	35413	9828.00
STR55UP TFC	35424	11069.00

- ▲ Long Time:
  - Adjustable from 0.8 to 1 times plug rating on STRxxDP, SP and UP trip units
  - Adjustable from 0.4 to 1 times sensor rating on STRxxDE, SE and UE trip units
  - Can be defeated by using LT OFF rating plug Cat. No. 35300 on STRxxDP, SP and UP trip units.
  - Substitute MI in the trip function block for factory installation. For use only on 400 A, 800 A and 1200 A.
- Cannot be used in a drawout assembly.
- ♦ Summary of Option:
  - F: Fault indicators
  - T: Residual-type ground-fault protection
  - C: Communication with Digipact®

**Table 11.60: Rating Plugs ★**

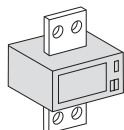
	Rating	Cat. No.	\$ Price
CK400	300 A	35304	245.00
	400 A	35306	245.00
CK800	600 A	35313	245.00
	700 A	35314	245.00
	800 A	35315	245.00
CK1200	900 A	35334	245.00
	1000 A	35335	245.00
CK1000L CK1000HL	600 A	35322	245.00
	800 A	35324	245.00
	1000 A	35325▼	245.00



**Table 11.61: External Neutral Sensor**

	Rating	Cat. No.	\$ Price
Ground-Fault Protection for 3Ø4W System	800 A	35701	1610.00
	1200 A	35703	1610.00

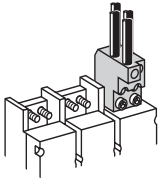
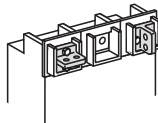
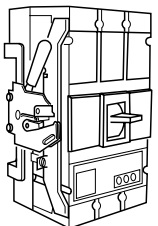
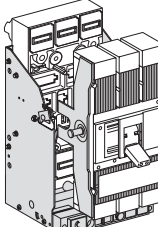
- ★ Required on STRxx25DP, SP and UP trip units only.
- ▼ Cannot be used in a drawout assembly.



Installation and Connection Accessories

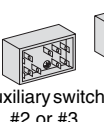
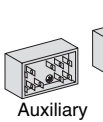
Compact® CK and C circuit breakers and related accessories are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.

Table 11.62: Installation and Connection Accessories

				Cat. No.	\$ Price		
	Bus Bar Connection—UL489	Connection screws and terminal cover		35626 (2)	192.00		
		800 A Lugs for CK400 and CK800		(3) 2/0 AWG—300 kcmil	46961	305.00	
		1200 A Lugs for CK1000 and CK1200		(4) 4/0 AWG—500 kcmil	46960■	359.00	
		Optional 1200 A Lugs		(3) 250–600 kcmil	46966■	359.00	
	Rear Connection UL489, C801/1001/1251	Flat Connection		N/H	46415	1220.00	
		Consisting of:		Rear connectors	N/H	46958 (6)▲	149.00
				Terminal cover		46993 (2)▲	165.00
		Edgewise Connection			N/H	46415	1220.00
	Standard Chassis—UL489	Consisting of:		Rear connectors	N/H	46958 (6)▲	149.00
				Terminal cover		46993 (2)▲	165.00
		Flat Connection Consisting of:		Complete chassis	N/H	46851	3708.00
				Plugs	N/H	46896 (3)▲	191.00
	Universal Chassis UL489, C801/1001/1251			Terminal cover		46993 (2)▲	165.00
				Rear connections		46990 (6)▲	80.00
		Edgewise Connection Consisting of:		Complete chassis	N/H	46851	3708.00
				Plugs	N/H	46896 (3)▲	191.00
				Terminal cover		46993 (2)▲	165.00
				Rear connections		46988 (6)▲	102.00
		Flat Connection Consisting of:		Plugs	N/H	46896 (3)▲	191.00
				Terminal cover		46993 (2)▲	165.00
				Rear connections		46990 (6)▲	80.00
		Edgewise Connection Consisting of:		Plugs	N/H	46896 (3)▲	191.00
				Terminal cover		46993 (2)▲	165.00
				Rear connections		46988 (6)▲	102.00

▲ Price is for each.  
■ Optional on CK400 and CK800.

Table 11.63: Accessories

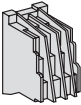
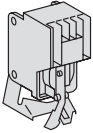

		Secondary Disconnecting Blocks	Cat. No.	\$ Price	
	Motor operator	Moving part UL489 only	3 terminal◆	36693	58.00
			6 terminal★	36696	89.00
	Shunt trip or Undervoltage release	Fixed part UL489, C801/1001/1251	3 terminal◆	42940	58.00
			6 terminal★	42941	89.00

◆ Three wires are needed for shunt trip or undervoltage trip.  
★ Six wires are needed for auxiliary switches or motor operator.

11 OBSOLETE CIRCUIT BREAKERS

**Compact® CK and C circuit breakers and related accessories are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.**

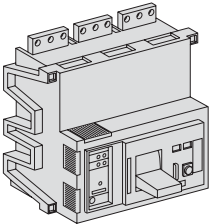
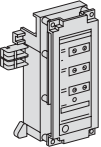
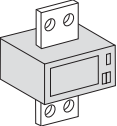
**Table 11.64: Accessories**

Electrical Accessories, UL489 only		Cat. No.	\$ Price		
	Auxiliary and Alarm Switch				
	One auxiliary (OF) + 1 alarm (SD) switch ▲		36405	453.00	
	Three auxiliary (OF) + 1 alarm (SD) switch ▲		36402	1235.00	
	Two auxiliary (OF) switches ▲		36404	641.00	
	Shunt Trip and Undervoltage Trip				
	MX (Shunt trip) ■	AC 60 Hz	240 V	36446	717.00
			480 V	36446	717.00
		DC	12 V	36434	717.00
			48 V	36436	717.00
	MN (Undervoltage trip) ◆	AC 60 Hz	110/130	44925★	717.00
			120 V	36418	717.00
			220/250 V	44926★	717.00
			240 V	36419	717.00
		DC	480 V	36420	717.00
48 V			36411	717.00	
<b>Installation Accessories, UL489, C801/1001/1251</b>					
	Extended Handle	Standard	46998	44.10	

- ▲ 6 A (auxiliary), 5 A (alarm) at 480 Vac; 3 A at 600 Vac; 0.5 A at 125 Vdc, 0.25 A at 250 Vdc.
- Minimum operating voltage 55% of rated voltage in ac and 75% of rated voltage in dc
- ◆ Dropout at 35–70% of rated voltage, pickup at 85% of rated voltage.
- ★ Available for C801/1001/1251 circuit breakers only.

Compact<sup>®</sup> CM circuit breakers and related accessories are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.

**Table 11.65: Compact CM Circuit Breakers**

	Rating	Trip Function	Cat. No.	\$ Price		
	<b>COMPACT CM Circuit Breaker</b>					
	CM1250HH	100% Rated—85 kA at 480 Vac	1250 A	ST306S	CMEF36125LS	24216.00
	CM1600HH		1600 A	ST206D	CMEF36160LI	23378.00
	CM1600HH		1600 A	ST306S	CMEF36160LS	25752.00
	CM2000HH ▲		2000 A	ST306S	CMEF36200LS	29328.00
	<b>Other Electronic Trip Units (Replaceable by Field Services only)</b>					
	Long-Time and Instantaneous Protection					
	ST206D		LI	55722	5168.00	
	Long-Time, Short-Time and Instantaneous Protection					
	ST306S		LS	55723	7542.00	
	Long-Time, Short-Time, Instantaneous Protection and Ground-Fault Protection					
ST306ST (1250–2000 A)		L2	55724	9896.00		
ST316ST (2500 A)		L2	55725	9896.00		
	<b>External Neutral Sensor</b>					
	Ground-Fault Protection for 3Ø4W System					
	For CM1250			55760	1823.00	
	For CM1600			55759	1823.00	
	For CM2000			55758	1823.00	
For CM2500			55757	1823.00		

▲ Rear Connections are included.

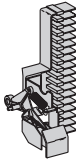
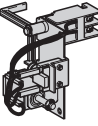
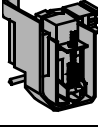

Ratings and interrupting ratings: 0600PL9701  
 Additional information: Catalog AC0036/3E, Data Sheet 0630HO9801  
 Accessories . . . . . Page 11-25

11 OBSOLETE CIRCUIT BREAKERS



**Compact® CM circuit breakers and related accessories are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.**

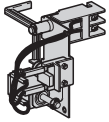
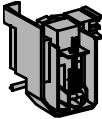

**Table 11.66: Accessories**

		Volts (V)	Cat. No.	\$ Price		
<b>Connection Accessories</b>	Connectors					
		2000 A (3 per kit for one side)	55797	1446.00		
		2500 A (Complete kit for line and load)	55799	6545.00		
Connectors are mandatory for line and load. Prices are given for replacement only.						
<b>Electrical Accessories</b>	Auxiliary Switches					
		Two auxiliary switch (OF) ■	55755	839.00		
		Four auxiliary switch (OF) + 1 alarm switch (SD) ■	55754	2097.00		
		Overcurrent trip switch ◆	Standard			
	Shunt Trip and Undervoltage Trip					
		MX (shunt trip)★	AC 60 Hz	120	55740	1239.00
				240	55741	1239.00
				480	55742	1239.00
		DC	24	55744	1239.00	
			48	55745	1239.00	
125			55746	1239.00		
	MN (undervoltage trip) ▼	AC 60 Hz	120	55728	1239.00	
			240	55729	1239.00	
			480	55730	1239.00	
	DC	24	55732	1239.00		
		48	55733	1239.00		
		125	55734	1239.00		
<b>Locks</b>	OFF Position Locking Device	Padlock device for 1 to 3 padlocks (padlocks not included) △	55653	279.00		
<b>Spare Parts</b>		Operating handle	55661	101.00		
		Extended toggle	55662	138.00		

- 6 A (auxiliary), 5 A (alarm) at 480 Vac; 3 A at 600 Vac; 0.5 A at 125 Vdc; 0.25 A at 250 Vdc.
- ◆ 2 A at 240 Vac and 0.1 A at 125 Vdc.
- ★ Minimum operating voltage 55% of rated voltage in AC and 75% of rated voltage in dc.
- ▼ Dropout at 35–70% of rated voltage, pickup at 85% of rated voltage.
- △ Field installable.

Compact® CM circuit breakers and related accessories are in obsolescence. Do not use on new applications. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.

Table 11.67: Accessories

			Volts (V)	Cat. No.	\$ Price	
External Neutral Sensor	Ground-Fault Protection for 3Ø4W Systems	CM1600		55529	1823.00	
		CM2000		55530	1823.00	
Connection Accessories	Rear Connectors	CM2500	Phase (Set of 4)	55377	1302.00	
Electrical Accessories	Shunt Trip and Undervoltage Trip					
		MX (shunt trip)	AC 50 Hz	110/127	55547	1239.00
			AC 60 Hz	120/127	55547	1239.00
				240/265	55548	1239.00
				DC	24	55544
			DC	30	55545	1239.00
				110/125	55547	1239.00
		MN (undervoltage trip)	AC 60 Hz	120	55558	1239.00
			DC	24	55563	1239.00
Locks	OFF Position Locking Device					
		Padlock device for 1 to 3 padlocks (padlocks not included) ■		55653	279.00	
Padlock device (Padlock not included) + 1 key lock		Ronis 135B▲	55655	462.00		
Spare Parts	For Compact CM Circuit Breaker	Operating handle		55661	101.00	
		Extended Handle		55662	138.00	
		3P Cover		55663	461.00	
	For Compact CM2500 N/H Circuit Breaker	Upstream or Downstream Central		55675	374.00	

- ▲ Factory-mounted only.
- Field-installable.

Ratings and Interrupting Values: Pricing Guide 0600PL9701.  
Additional Information: Data Sheet ABTED397059.

Masterpact® circuit breakers and related accessories are in obsolescence. Use Masterpact NT/NW for new applications. See Digest 175. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.

**To order a complete circuit breaker, order:**

1. Circuit breaker frame.....page 11-27  
or cradle only.....page 11-28  
or circuit breaker without cradle.....page 11-28
2. Connections.....page 11-28
3. Control unit.....page 11-29
4. Rating plug.....page 11-29
5. Accessories.....page 11-30

**Table 11.68: UL Listed Masterpact Circuit Breaker Frame**

	Rating	AIR/ 480 V	Fixed 3P	Fixed 4P	Drawout with Cradle 3P	Drawout with Cradle 4P	\$ Price	
MP08 to MP63— UL 489/NEMA AB1 Standards	<b>Standard Interrupting (H1)</b>							
	MP08H1	800 A	65 kA	P08H13FPPS0800	P08H14FPPS0800	P08H13DPPS0800	P08H14DPPS0800	
	MP12H1	1200 A	65 kA	P12H13FPPS1200	P12H14FPPS1200	P12H13DPPS1200	P12H14DPPS1200	
	MP16H1	1600 A	65 kA	P16H13FPPS1600	P16H14FPPS1600	P16H13DPPS1600	P16H14DPPS1600	
	MP20H1	2000 A	75 kA	P20H13FPPS2000	P20H14FPPS2000	P20H13DPPS2000	P20H14DPPS2000	
	MP25H1	2500 A	75 kA	P25H13FPPS2500	P25H14FPPS2500	P25H13DPPS2500	P25H14DPPS2500	
	MP30H1	3000 A	75 kA	P30H13FPPS3000	P30H14FPPS3000	P30H13DPPS3000	P30H14DPPS3000	
	MP40H1	4000 A	100 kA	P40H13FPPS4000	—	P40H13DPPS4000	P40H14DPPS4000♦	
	MP50H1	5000 A	100 kA	P50H13FPPS5000	—	P50H13DPPS5000	P50H14DPPS5000♦	
	MP63H1	6300 A	100 kA	—	—	P63H13DPPS6300♦	—	
	<b>High Interrupting (H2)</b>							
	MP08H2	800 A	100 kA	P08H23FPPS0800	P08H24FPPS0800	P08H23DPPS0800	P08H24DPPS0800	
	MP12H2	1200 A	100 kA	P12H23FPPS1200	P12H24FPPS1200	P12H23DPPS1200	P12H24DPPS1200	
	MP16H2	1600 A	100 kA	P16H23FPPS1600	P16H24FPPS1600	P16H23DPPS1600	P16H24DPPS1600	
	MP20H2	2000 A	100 kA	P20H23FPPS2000	P20H24FPPS2000	P20H23DPPS2000	P20H24DPPS2000	
	MP25H2	2500 A	100 kA	P25H23FPPS2500	P25H24FPPS2500	P25H23DPPS2500	P25H24DPPS2500	
	MP30H2	3000 A	100 kA	P30H23FPPS3000	P30H24FPPS3000	P30H23DPPS3000	P30H24DPPS3000	
	MP40H2	4000 A	125 kA	P40H23FPPS4000	—	P40H23DPPS4000	P40H24DPPS4000♦	
	MP50H2	5000 A	125 kA	P50H23FPPS5000	—	P50H23DPPS5000	P50H24DPPS5000♦	
	MP63H2	6300 A	150 kA	—	—	P63H23DPPS6300♦	—	
	<b>Switches (NA)—Control Unit and Rating Plug Not Required</b>							
	MP08NA	800 A	—	P08NA3FPPS0000	P08NA4FPPS0000	P08NA3DPPS0000	P08NA4DPPS0000	
	MP12NA	1200 A	—	P12NA3FPPS0000	P12NA4FPPS0000	P12NA3DPPS0000	P12NA4DPPS0000	
	MP16NA	1600 A	—	P16NA3FPPS0000	P16NA4FPPS0000	P16NA3DPPS0000	P16NA4DPPS0000	
	MP20NA	2000 A	—	P20NA3FPPS0000	P20NA4FPPS0000	P20NA3DPPS0000	P20NA4DPPS0000	
	MP25NA	2500 A	—	P25NA3FPPS0000	P25NA4FPPS0000	P25NA3DPPS0000	P25NA4DPPS0000	
	MP30NA	3000 A	—	P30NA3FPPS0000	P30NA4FPPS0000	P30NA3DPPS0000	P30NA4DPPS0000	
	MP40NA	4000 A	—	P40NA3FPPS4000	—	P40NA3DPPS0000	P40NA4DPPS0000♦	
	MP50NA	5000 A	—	P50NA3FPPS5000	—	P50NA3DPPS0000	P50NA4DPPS0000♦	
	MP63NA	6300 A	—	—	—	P63NA3DPPS0000♦	—	
	MC08 to MC50— UL1066/ANSI C37.13/NEMA SG3 Standards	<b>Special Interrupting (N1)</b>						
		MC08N1	800 A	50 kA	—	—	C08N13DPPS0800	C08N14DPPS0800
		MC16N1	1600 A	50 kA	—	—	C16N13DPPS1600	C16N14DPPS1600
<b>Standard Interrupting (H1)</b>								
MC08H1		800 A	65 kA	—	—	C08H13DPPS0800	C08H14DPPS0800	
MC16H1		1600 A	65 kA	—	—	C16H13DPPS1600	C16H14DPPS1600	
MC20H1		2000 A	65 kA	—	—	C20H13DPPS2000	C20H14DPPS2000	
MC32H1		3200 A	65 kA	—	—	C32H13DPPS3200	—	
MC40H1		4000 A	100 kA	—	—	C40H13DPPS4000	—	
MC50H1		5000 A	100 kA	—	—	C50H13DPPS5000	—	

Contact Schneider Electric  
Cedar Rapids Plant Customer  
Service Group for current  
pricing and availability.

**11** OBSOLETE CIRCUIT BREAKERS

♦ Not UL Listed

Additional information: Catalog 0631CT9501, Data Sheet 0631HO9701

Masterpact® circuit breakers and related accessories are in obsolescence. Use Masterpact NT/NW for new applications. See Digest 175. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.

Table 11.69: Masterpact Drawout Circuit Breaker Without Cradle or Cradle Only

	Rating	AIR 480 V	Drawout w/o Cradle 3P	Cradle Only 3P	Drawout w/o Cradle 4P	Cradle Only 4P	\$ Price
MP08 to MP63 UL 489/NEMA AB1 Standards	<b>Standard Interrupting (H1)</b>						
	MP08H1	800 A	65 kA	P08H13A0800	P16H03C	P08H14A0800	P16H04C
	MP12H1	1200 A	65 kA	P12H13A1200	P16H03C	P12H14A1200	P16H04C
	MP16H1	1600 A	65 kA	P16H13A1600	P16H03C	P16H14A1600	P16H04C
	MP20H1	2000 A	75 kA	P20H13A2000	P20H03C	P20H14A2000	P20H04C
	MP25H1	2500 A	75 kA	P25H13A2500	P30H03C	P25H14A2500	P30H04C
	MP30H1	3000 A	75 kA	P30H13A3000	P30H03C	P30H14A3000	P30H04C
	MP40H1	4000 A	100 kA	P40H13A4000	P40H03C	P40H14A4000▲	P40H04C▲
	MP50H1	5000 A	100 kA	P50H13A5000	P50H03C	P50H14A5000▲	P50H04C▲
	MP63H1	6300 A	100 kA	P63H13A6300▲	P63H03C▲	—	—
	<b>High Interrupting (H2)</b>						
	MP08H2	800 A	100 kA	P08H23A0800	P16H03C	P08H24A0800	P16H04C
	MP12H2	1200 A	100 kA	P12H23A1200	P16H03C	P12H24A1200	P16H04C
	MP16H2	1600 A	100 kA	P16H23A1600	P16H03C	P16H24A1600	P16H04C
	MP20H2	2000 A	100 kA	P20H23A2000	P20H03C	P20H24A2000	P20H04C
	MP25H2	2500 A	100 kA	P25H23A2500	P30H03C	P25H24A2500	P30H04C
	MP30H2	3000 A	100 kA	P30H23A3000	P30H03C	P30H24A3000	P30H04C
	MP40H2	4000 A	125 kA	P40H23A4000	P40H03C	P40H24A4000▲	P40H04C▲
	MP50H2	5000 A	125 kA	P50H23A5000	P50H03C	P50H24A5000▲	P50H04C▲
	MP63H2	6300 A	150 kA	P63H23A6300▲	P63H03C▲	—	—
	<b>Switches (NA)—Control Units and Rating Plug Not Required</b>						
	MP08NA	—	—	P08NA3A0000	P16H03C	P08NA4A0000	P16H04C
	MP12NA	—	—	P12NA3A0000	P16H03C	P12NA4A0000	P16H04C
	MP16NA	—	—	P16NA3A0000	P16H03C	P16NA4A0000	P16H04C
	MP20NA	—	—	P20NA3A0000	P20H03C	P20NA4A0000	P20H04C
	MP25NA	—	—	P25NA3A0000	P30H03C	P25NA4A0000	P30H04C
	MP30NA	—	—	P30NA3A0000	P30H03C	P30NA4A0000	P30H04C
	MP40NA	—	—	P40NA3A0000	P40H03C	P40NA4A0000▲	P40H04C▲
MP50NA	—	—	P50NA3A0000	P50H03C	P50NA4A0000▲	P50H04C▲	
MP63NA	—	—	P63NA3A0000▲	P63H03C▲	—	—	
MC08 to MC50 UL 1066/ANSI C37.13/NEMA SG3 Standards	<b>Special Interrupting (N1)</b>						
	MC08N1	800 A	50 kA	C08N13A0800	C16H03C	C08N14A0800	C16H04C
	MC16N1	1600 A	50 kA	C16N13A1600	C16H03C	C16N14A1600	C16H04C
	<b>Standard Interrupting (H1)</b>						
	MC08H1	800 A	65 kA	C08H13A0800	C16H03C	C08H14A0800	C16H04C
	MC16H1	1600 A	65 kA	C16H13A1600	C16H03C	C16H14A1600	C16H04C
	MC20H1	2000 A	65 kA	C20H13A2000	C20H03C	C20H14A2000	C20H04C
	MC32H1	3200 A	65 kA	C32H13A3200	C32H03C	—	—
	MC40H1	4000 A	100 kA	C40H13A4000	C40H03C	—	—
	MC50H1	5000 A	100 kA	C50H13A5000	C50H03C	—	—

Contact Schneider Electric Cedar Rapids Plant Customer Service Group for current pricing and availability.

Note: Prices do not include control unit and rating plug.  
Cradle price is included in the complete drawout price.  
Vertical connections (CCS) are mandatory on 1600 A frame and above, and are optional for 800 A and 1200 A frames.

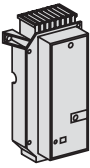
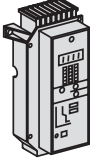
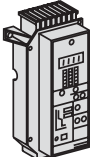

Table 11.70: Vertical Connections

- Vertical terminations are mandatory on 1600 A frame and above.

	3P Cat. No.	4P Cat. No.	\$ Price
MP08–MC08–MP12–MP16–MC16	R16H03CBCP	R16H04CBCP	Contact Schneider Electric Cedar Rapids Plant Customer Service Group for current pricing and availability.
MP20–MC20	R20H03CBCP	R20H04CBCP	
MP25–MP30	R30H03CBCP	R30H04CBCP	
MC32	R32H03CBCP	—	
MP40–MC40	R40H03CBCP	R40H04CBCP	
MP50–MC50–MP63	R63H03CBCP	R50H04CBCP	
▲ Not UL Listed.			

Masterpack® circuit breakers and related accessories are in obsolescence. Use Masterpack NT/NW for new applications. See Digest 175. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.

Table 11.71: Control Units

Control Unit	\$ Price	Ground-Fault Protection▲	Suffix	\$ Price	Options	Suffix	\$ Price
<b>STR 18M (Instantaneous protection only)</b>							
 STR18M	4218.00						
<b>STR 28D (Long-time and instantaneous protection)</b>							
 STR28D (long-time = 0.4x1 sensor rating)	4467.00				Ammeter	I	2688.00
STR28DP (long-time = 0.8x1 plug rating)	4140.00				Pre-trip overload indication switch	ALR	No charge
<b>STR 38S (Long-time, short-time and instantaneous protection)</b>							
 STR38S (long-time = 0.4x1 sensor rating)	6534.00	Residual type	T	2637.00	Ammeter	I	2688.00
STR38SP (long-time = 0.8x1 plug rating)	6207.00	Source ground return type	W	2940.00	Pre-trip overload indication switch	ALR	No charge
		External neutral sensor (TCE) – see page 11-30			LED fault indicators on the circuit breaker front face (PIL or AD module or 24 Vdc external power supply is required)	F	1071.00
					Power supply with battery	PIL	720.00
<b>STR 58U (long-time, short-time and instantaneous protection)</b>							
 STR58U (long-time = 0.4x1 sensor rating)	7338.00	Residual type■	T	2637.00	Ammeter	I	2688.00
STR58UP (long-time = 0.8x1 plug rating)	7011.00	Source ground return type■	W	2940.00	Pre-trip overload indication switch	ALR	No charge
		External neutral sensor (TCE) ■ – see page 11-30			LED fault indicators on the circuit breaker front face (PIL or AD module or 24 Vdc external power supply is required)	F	1071.00
					Segregated alarm switch (fault indicator [F] included. Output contact as a function of selected fault type. 24 Vdc external power supply or AD module is mandatory)	FV	2934.00
					Power supply with battery	PIL	720.00
					Zone-selective interlocking, for short-time protection (ST) and ground-fault protection (T/W)	Z	2445.00
					Load monitoring (outputs optical trial output contacts 0.1 A 240 Vac)	R	3171.00
					Communication (transmits all the trip unit parameters via Digipact® modules)	C	1923.00

- ▲ External neutral sensor not included.
- External AD module (see page 11-30) is required if load is below 20% or if setting is red zone.

Table 11.72: Rating Plug (RL)

Sensor Rating	Plug Rating	Cat. No.	\$ Price	Sensor Rating	Plug Rating	Cat. No.	\$ Price	
250 A	125 A	54731	327.00	2500 A	1200 A	54759	327.00	
	150 A	54732	327.00		1600 A	54760	327.00	
	200 A	54733	327.00		2000 A	54761	327.00	
	250 A	54734	327.00		1600 A	54763	327.00	
400 A	200 A	54735	327.00	3000 A	2000 A	54764	327.00	
	250 A	54736	327.00		2500 A	54765	327.00	
	300 A	54737	327.00		3000 A	54766	327.00	
	400 A	54738	327.00		1600 A	54846	327.00	
600 A	300 A	54739	327.00	3200 A	2000 A	54845	327.00	
	400 A	54740	327.00		2500 A	54844	327.00	
	500 A	54741	327.00		3000 A	54843	327.00	
	600 A	54742	327.00		3200 A	54842	327.00	
800 A	400 A	54743	327.00	4000 A	2000 A	54767	327.00	
	500 A	54744	327.00		2500 A	54768	327.00	
	600 A	54745	327.00		3200 A	54841	327.00	
	800 A	54746	327.00		3000 A	54772	327.00	
1200 A	600 A	54747	327.00	5000 A	3200 A	54840	327.00	
	800 A	54748	327.00		4000 A	54773	327.00	
	1000 A	54749	327.00		5000 A	54774	327.00	
	1200 A	54750	327.00		3000 A	54839	327.00	
1600 A	800 A	54751	327.00	6300 A	3200 A	54838	327.00	
	1000 A	54752	327.00		4000 A	54837	327.00	
	1200 A	54753	327.00		5000 A	54836	327.00	
	1600 A	54754	327.00		6000 A	54835	327.00	
2000 A	1000 A	54755	327.00	6300 A	6300 A	54834	327.00	
	1200 A	54756	327.00					
	1600 A	54757	327.00					
	2000 A	54758	327.00					

**NOTE:** Mandatory for UL Listed Masterpack circuit breakers with STR 28D, STR 38S and STR 58U control units. Not required on IEC Rated Masterpack circuit breakers.

11 OBSOLETE CIRCUIT BREAKERS

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**Table 11.73: Neutral Sensor for 3ØH4W Systems (TCE)**

**NOTE:** External neutral transformer (TCE) must have the same rating as the circuit breaker current sensor.

	Rating	Cat. No.	\$ Price▲
	250 A	685512	1584.00
	400 A	685514	1584.00
	600 A	685516	1584.00
	800 A	685518	1584.00
	1000 A	685519	1584.00
	1250 A	685523	1584.00
	1600 A	685524	1584.00
	2000 A	685525	1584.00
	2500 A	685526	1584.00
	3000 A	685527	1584.00
	3200 A	685528	1584.00
	4000 A	685521	1584.00
5000 A	685673	3012.00	

▲ Discount Schedule DE2G.




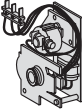
**Table 11.74: Accessories (Must be ordered as separate items)**

Accessory	Description	Discount Schedule	Cat. No.	\$ Price	
<b>Sealable Cover (PBD)</b>					
	For sealing STR 18M, STR 28D, STR 38S and STR 58U control units (supplied with unit at no charge)	DE2G	685837	162.00	
<b>Test Kit (ME)</b>					
	For testing STR 28D, STR 38S and STR 58U control units Power supply 110, 220 Vac 50/60 Hz	DE5A	55391	16365.00	
	Spare test cable for Masterpact	DE2G	55390	489.00	
	Spare test cable kit (Compact and Masterpact)	DE2	34546	1316.00	
<b>Mini Test Kit (BU)</b>					
	For testing STR 28D, STR 38S and STR 58U control units—identical to Compact test kit box (batteries not supplied)	DE2	43362	884.00	
<b>Power Supply Module (AD)</b>					
	For STR 18M to STR 58U control units <b>Output voltage: 24 Vdc</b>	Input voltage			
		24/30 Vdc	DE2F	685823	1238.00
		48/60 Vdc		685824	1238.00
		125 Vdc		685825	1238.00
		120 Vac 50/60 Hz		685826	1238.00
		220 Vac 50/60 Hz		685827	1238.00
380 Vac 50/60 Hz	685829	1238.00			
<b>Battery Module (BAT)</b>					
	Battery back-up power supply for AD module	DE2F	685831	3570.00	

11 OBSOLETE CIRCUIT BREAKERS

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




**Table 11.75: Accessories for Circuit Breaker Frame**

		Volts (V)	Cat. No. (XF)	Cat. No. (MX)	\$ Price	
<ul style="list-style-type: none"> <li>When adding (not replacing) field-installable accessories, refer to page 11-32 for secondary disconnects.</li> <li>Maximum 2 shunt trips or 1 shunt trip + 1 undervoltage trip.</li> </ul>						
Closing Coil (XF)/Shunt Trip (MX)						
	AC 50/60 Hz	100 ▲	685655CC	685655ST	1095.00	
		110/127	685654CC	685654ST	1095.00	
		220/250	685658CC	685658ST	1095.00	
		277 ▲	685659CC	685659ST	1095.00	
		380/415 ▲	685660CC	685660ST	1095.00	
		440/480	685661CC▲	685661ST	1095.00	
	DC	24	685650CC	685650ST	1095.00	
		30 ▲	685651CC	685651ST	1095.00	
		48	685652CC	685652ST	1095.00	
		60 ▲	685653CC	—	1095.00	
		100/110 ▲	685654CC	685654ST	1095.00	
		125	685656CC	685656ST	1095.00	
		200/220 ▲	685658CC	685658ST	1095.00	
		250	685659CC▲	685659ST	1095.00	
	350	685660CC	685660ST	1095.00		
	Undervoltage Trip (MN)					
		AC 50/60 Hz	220/250		685683	1731.00
			277 ▲		685684	1731.00
440/480				685686	1731.00	
DC		24		685675	1731.00	
		30 ▲		685676	1731.00	
		60		685678	1731.00	
		100/110 ▲		685679	1731.00	
		125		685681	1731.00	
		200/220▲		685683	1731.00	
		250		685684	1731.00	
Time Delayed Undervoltage Trip (MNR) – Not UL Listed						
	AC 50/60 Hz	100		685689	3360.00	
		110/127		685690	3360.00	
		220/250		685692	3360.00	
		440/480		685694	3360.00	
	MNRI=MNR (see above) + 688337				237.00	
Spring Charging Motor (MCH)—Includes Spring Charged Switch						
	AC 50/60 Hz	100/127		685762	6135.00	
		200/240		685763	6135.00	
		250/277▲		685759	6135.00	
		480▲		685769	6135.00	
	DC	24/30		685760	6135.00	
		48/60		685761	6135.00	
		100/125		685765	6135.00	
		200/250▲		685766	6135.00	
Mechanical Operation Counter (CDM) (Works With Motor Only)						
				685733	1512.00	

▲ Not UL Listed.

**Masterpact® circuit breakers and related accessories are in obsolescence. Use Masterpact NT/NW for new applications. See Digest 175. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.**

**Table 11.76: Accessories for Circuit Breaker Frame—Continued**

		Cat. No.	\$ Price		
• When adding (not replacing) field-installable accessories, refer to this page for secondary disconnects.					
Two Standard (2a+2b) Auxiliary Switches		Standard	No charge		
Four Auxiliary Switches (OF)					
	Four changeovers (SPDT)	685725	<b>897.00</b>		
	One Ready to Close Switch (PF)				
	One ready to close switch	685727	<b>774.00</b>		
	One Overcurrent Trip Switch (SDE)				
Not available on switch version		Standard	No charge		
Secondary Disconnects (Supplied at no charge when ordering with complete circuit breaker or adding field-installable accessories.)					
	Fixed mounting	685871	No charge		
	Consisting of:	Empty socket	685990 (1)	No charge	
		Connectors (12 terminals)	685995 (2)	No charge	
	Drawout mounting	685868	No charge		
	Five additional terminal blocks (BS)	685994	No charge		
	Push Button Padlocking Device (VBP)				
By padlock (not supplied)		685728	<b>306.00</b>		
"OFF" Position Lock by Key Lock					
	KIRK® key lock with provision	VSKA	685732+35635	<b>2547.00</b>	
	Provision for KIRK key lock	VKA	685732	<b>1491.00</b>	
	Ronis (1 key lock) with provision	VSRA1	685730	<b>711.00</b>	
	Ronis (2 key locks keyed alike) with provision	VSRA2	685738	<b>1419.00</b>	
Mechanical Interlocking for Fixed Circuit Breakers (Must be ordered as a separate item. Not UL Listed.)					
Two circuit breakers		Stacks—mounted, by rigid link	VM2FT	685985	<b>4767.00</b>

11 OBSOLETE CIRCUIT BREAKERS



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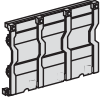



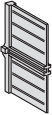
**Table 11.77: Accessories for Cradle**

			Cat. No.	\$ Price	
<b>Position Switches</b>					
	Four SPDT connected position switches (CE)		685977	375.00	
	Two SPDT disconnected position switches (CD)		685978	183.00	
<b>Padlocking Device</b>			Standard	No charge	
<b>Disconnected Position Lock by Key Lock (Factory Mounted) (Not UL Listed)</b>					
	By Ronis key lock	One key lock supplied + provision	VSRC1	685969	768.00
	By KIRK® key lock	One key lock + provision	VSKC	35635▲ + 685971	2547.00
		Provision only	VKC	685971	1491.00
<b>Door Interlock (VPEC)</b>					
	Lock when circuit breaker connected		685966	543.00	
	Racking Interlock when Door Opened (VPOC)				
	One piece		685967	390.00	
	Withdrawal/Spring Charged Interlock (VEAA) (Factory Mounted)				
	Incompatible with MN or MNR undervoltage trip		685857	1026.00	
	<b>Mechanical Interlocking for Drawout Circuit Breakers (Must be ordered as a separate item. Not UL Listed.)</b>				
	Two device	Stacks—mounted, by rigid link	VM2CT	685975	3786.00
		Adjacent, by flexible link	VM2CC	685959	4464.00

▲ Discount Schedule DE2

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**Table 11.78: Accessories for Cradle—Continued**




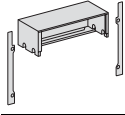
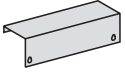
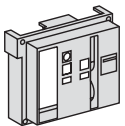
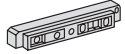
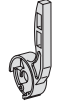


			Cat. No.	\$ Price	
<b>Safety Shutters (VO)</b>					
	MP08–MP20–MC08–MC20	3P	M08–M25	685946	1119.00
		4P	M08–M25	685947	1455.00
	MP25–MP30	3P	M32 ▲	685948	1119.00
		4P	M32 ▲	685949	1455.00
	MC32	3P	M40 ▲	685950	1119.00
<b>Shutter Locking Device (VVC)</b>					
	MP08–MP30–MC08–MC20		M08–M32	685965	165.00
	MC32	4P	M40	685965 (2) ■	165.00
	MP40–MP63–MC40–MC50		M50–M63	685965 (2) ■	165.00
<b>Door Escutcheon</b>					
	Can be used with fixed or drawout circuit breakers			685980 ♦	404.00
	<b>Door Escutcheon with Transparent Cover (CCP)</b>				
	Provides a higher degree of protection			685981 ♦	1412.00
	<b>Interphase Barrier (EIP) (Not available for 4000 A, 5000 A, 6300 A and all fixed-mounted circuit breakers.) (Kit contains 3 barriers.)</b>				
	3P			685979	261.00
	4P			685979	261.00

- ▲ Only field-installable if not mounted in switchgear.
- Price is for each.
- ♦ Discount Schedule DE2F

**11 OBSOLETE CIRCUIT BREAKERS**

Masterpack® circuit breakers and related accessories are in obsolescence. Use Masterpack NT/NW for new applications. See Digest 175. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.



Table 11.79: Spare Parts

		Cat. No.	\$ Price		
<b>Arc Chute (1 piece)</b>					
	AC	685548	645.00		
<b>Clusters for Cradle (Set of 2)</b>					
	MP08-MP16 3P	M16N 3P	685872 (3)▲	1338.00	
	MC08-MC16 3P		685872 (3)▲	1338.00	
	MP08-MP16 4P	M16N 4P	685874 (3)▲	1845.00	
	MC08-MC16 4P		685874 (3)▲	1845.00	
	MP20-MC20 3P	M20-M25N 3P	685874 (3)▲	1845.00	
	MP20-MC20 4P	M20-M25N 4P	685874 (4)▲	1845.00	
		M08-M16H/L 3P	685872 (3)▲	1338.00	
		M08-M16H/L 4P	685872 (4)▲	1338.00	
		M20-M25H 3P	685874 (3)▲	1845.00	
		M20-M25H 4P	685874 (4)▲	1845.00	
		MP25-MP30 3P	M20-M25L 3P	685875 (3)▲	2346.00
		MP25-MP30 4P	M20-M25L 4P	685875 (4)▲	2346.00
			M32H 3P	685875 (3)▲	2346.00
			M32H 4P	685875 (4)▲	2346.00
	MP40-MP50 3P	M50H 3P	685875 (6)▲	2346.00	
		M50H 4P	685875 (7)▲	2346.00	
<b>Arc Chute Cover (CC)</b>					
	Fixed				
	MP08-MP30 3P	M08-M30 3P	690300	1104.00	
	MP40-MP50 3P		690302	1953.00	
	Drawout				
	MP08-MP30 3P	M10-M40DC 3P	689623	894.00	
	MC08-MC20 3P		689623	894.00	
		M08-M32 3P	685960	894.00	
<b>Secondary Disconnect Terminal Cover (CB)</b>					
	Drawout				
	MP08-MP30 3P		689619	558.00	
	MC08-MC20 3P		689619	558.00	
	MP40-MP50 3P		689621	996.00	
<b>Escutcheon for Circuit Breaker (1 Piece)</b>					
	MP08-MP30 3P	M08-M32 3P	685710	681.00	
	MC08-MC20 3P	M40 4P			
	MP40-MP50 3P	M50 3P			
	MC40-MC50 3P				
	MP08-MP20 4P		685711	819.00	
	MC08-MC20 4P				
	MP63 3P	M32 4P			
	MC32 3P	M40 3P			
	MP40-MP50 4P	M50 4P			
	MC40-MC50 4P	M63 3P			
<b>Escutcheon for Chassis</b>					
	One piece	685633	441.00		
<b>Charging Handle</b>					
	One piece	685713	267.00		
<b>Fixing Bracket</b>					
	Two pieces	685926	753.00		
<b>Racking Handle</b>					
	One piece	685631	450.00		

▲ Price is for each.

Masterpact® circuit breakers and related accessories are in obsolescence. Use Masterpact NT/NW for new applications. See Digest 175. Limited service stock is available for replacement or fill purposes. Contact your local sales office for product availability.

**Table 11.80: Spare Parts—Continued**

		Cat. No.	\$ Price
Circuit Breaker Mismatch Protection (Vdc)			
	One piece	685974	159.00
Sealable Cover			
	For STR 18M to STR 58U (PBD) control units	685837	162.00
Installation Instructions			
	IEC Rated Masterpact circuit breakers	689990	No charge
	UL Listed Masterpact circuit breakers	48049-071-02	No charge
Vertical UL 489—UL 1066 Connectors			
	MP08—MC08—MP12—MP16—MC16 3P (set of three)	685884 (2)▲	1044.00
	MP20—MC20 3P (set of three)	685916 (2)▲	1308.00
	MP25—MP30 3P (set of three top or bottom connectors)	685915 (2)▲	3489.00
	MP40—MC40 3P (set of six connectors)	688256 (1)▲	8886.00
	MP50—MC50—MP63 3P (set of six top or bottom connectors)	688256 (2)▲	8886.00

▲ Price is for each.

**12 Obsolete Motor Control Centers**

**Model 4**

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Branch Feeder Units	12-2
Circuit Breaker Type Combination Starter Units	12-3
Fusible Switch Type Combination Starter Units	12-4

**Series 5600**

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General Information	12-5
Branch Feeder Units	12-6
Circuit Breaker Type Combination Starter Units	12-6

This section covers Model 4 Motor Control Center (MCC) unit availability during product obsolescence. All Model 4 orders can be completely defined by price, catalog type, and modifications. Layout sheets and data sheets are not required for order entry.

All unit prices are shown as NEMA 1. If a NEMA 12 unit is required, multiply the base price by 1.06. Note the standard features of the unit. Please refer to footnotes for important information.

Model 4 structures are no longer available. Transition sections can be provided to match an existing Model 4 MCC to a Model 6 MCC.

**Model 4 to Model 6 Transition**

Provides transition from a Model 4 to a Model 6 MCC. The transition requires a 12-inch extension on the first section of the Model 6 lineup. The transition section must be ordered with at least one Model 6 section and cannot ship separately. THE MODEL 6 BUS MUST BE OF EQUAL OR GREATER AMPACITY THAN THE MODEL 4 BUS. The transition section includes all required splice bars. (Reference the Model 6 Motor Control Center Pricing Guide.)

Please supply original Model 4 factory order number, basic configuration, and Model 4 bus amperage, material, and plating at time of order.

Compatible structure depths include:

- 15-inch deep Model 6 to 14-inch deep Model 4
- 20-inch deep Model 6 to 20-inch deep Model 4

**Branch Feeder Units and Modifications**

**Table 12.1: Circuit Breaker Branch Feeder Units ▲**

No. of Poles	Trip Rating	Breaker Frame Type	Unit Type No.	\$ Price	Space Factor
3	15	FH	BW423	2150.00	1
	20		BW424		
	30		BW425		
	40		BW429		
	50		BW428		
	60	FH	BW426	2376.00	
	70		BW450		
	80		BW451		
	90		BW452		
	100		BW427		
	125	KH	BY405	6336.00	1-1/2
	150		BY406		
	175		BY409		
	200		BY407		
	225		BY408		

▲ All branch circuit breakers are thermal magnetic with high interrupting Form Y532.

**Table 12.2: Dual Mounted Units**

No. of Poles	Trip Rating	Breaker Frame Type	Unit Type No.	\$ Price	Space Factor
3	15/15	FH/FH	BW453	3908.00	1-1/2
	20/20		BW454		
	30/30		BW455		
	50/50	BW456			
	60/60	FH/FH	BW457	3988.00	
	100/100		BW458		

**Table 12.3: Miscellaneous Items**

Unit	Description	Price
K401 ■	1/ 2 S.F. Blank Plate	\$ 68.00
K402 ■	1 S.F. Blank Plate	68.00
K404 ■	2 S.F. Blank Plate	106.00

■ Unit support pan included.

**Table 12.4: Fusible Switch Branch Feeder Units—3-pole ♦**

Voltage	Max. Fuse Size	Unit Type No.	\$ Price	Space Factor
250	30	KW408	1214.00	1
	60	KX409	1214.00	1
	100	KY409	1714.00	1
	200	KZ409	2046.00	2-1/2
600	30	KW409	1214.00	1
	60	KX410	1214.00	1
	100	KY410	1714.00	1
	200	KZ410	2046.00	2-1/2

NOTE: Fusible branch feeders 30-200 amp using Class H fuse clips have a short circuit rating of 10,000 AIR @ 600 V. If Class R fuse clips are required, order field installable kit from Digest.

♦ Fuses not included.

**Table 12.5: Starter Unit Options**

Description	Form No.	Price
Start-Stop PB with 1 Pilot light — Red (On)★	AP	\$284.00
Forward-Reverse-Stop PB with 2 Pilot Lights▼	A1PP	616.00
High-Low-Stop PB with 2 Pilot Lights△	A2PP	616.00
Hand-Off-Auto SS with 1 Pilot Light — Red (On)★	CP	284.00
1 Pilot Light only — Red (On)★	P	151.00
2 Pilot Lights — Red (On)▼	PP	384.00

★ Full Voltage Non-Reversing units only.

▼ Reversing units only.

△ Two-Speed units only.

**Table 12.6: Miscellaneous Units**

MT Units (Undrilled Panel and Hinged Door)			
Unit Type No.	Space Factors	Panel Dimensions□	Price
MT414	1	11-3/ 4 in. H x 13-5/ 8 in. W	\$450.00
MT415	2	22-1/ 3 in. H x 13-5/ 8 in. W	908.00

□ Dimensions are in inches — Depth from door to panel is 7.50 inches.

**Table 12.7: Full Voltage Non-Reversing**

Maximum Horsepower At				NEMA Starter Size	C/B Amp	Unit Type No.	Space Factor	\$ Price With FT▲	\$ Price With SY74	No. of Thermal Units Required♦
208 V	240 V	480 V	600 V							
1/4-1/3	1/3	1	1/4-1	1	3	EC403	1	3480.00	3190.00	3
1/2-1	1	3	1-1/2-3		7	EC404				
1-1/2-3	3	7-1/2	5-10		15	EC405				
5	7-1/2	10	—		30	EC406				
1-1/2-3	3	7-1/2	5-10	1	15	EC409	1-1/2■	4772.00	4475.00	3
5	7-1/2	10	—		30	EC410				
5	7-1/2	15	15-20	2	30	ED402	1	4695.00	4297.00	3
7-1/2-10	10	25	25		50	ED403				
—	15	—	—		100	ED404				
5	7-1/2	15	15-20	2	30	ED405	1-1/2■	5718.00	4884.00	3
7-1/2-10	10	25	25		50	ED406				
—	15	—	—		100	ED407				
—	—	—	—		—	—				
10	10	25	25-30	3	50	EE404	1-1/2	6490.00	5884.00	3
15-25	30	50	40-50		100	EE405				
30	40	—	—	4	225	EF406	2	11615.00	10798.00	3
40	—	75	100		225	EF407				
—	50	100	—		225	EF408				

**Table 12.8: Full Voltage Reversing**

Maximum Horsepower At				NEMA Starter Size	C/B Amp	Unit Type No.	Space Factor	\$ Price With FT▲	\$ Price With SY74	No. of Thermal Units Required♦
208 V	240 V	480 V	600 V							
1/4-1/3	1/3	1	1/4-1	1	3	FC408	1-1/2	4877.00	4480.00	3
1/2-1	1	3	1-1/2-3		7	FC409				
1-1/2-3	3	7-1/2	5-10		15	FC410				
5	7-1/2	10	—		30	FC411				
5	7-1/2	15	15-20	2	30	FD402	2	6251.00	5851.00	3
7-1/2-10	10	25	25		50	FD403				
—	15	—	—		100	FD404				

**Table 12.9: Two-Speed, Constant Hp, Full Voltage Non-Reversing**

Maximum Horsepower At				NEMA Starter Size	C/B Amp	One Winding (Consequent Pole)				Two Winding (Separate Winding)				No. of Thermal Units Required♦
208 V	240 V	480 V	600 V			Unit Type No.	Space Factor	\$ Price w/ FT▲	\$ Price w/ SY74	Unit Type No.	Space Factor	\$ Price w/ FT▲	\$ Price w/ SY74	
—	—	1/2	1/4-3/4	1	3	HC415	2	4301.00	3846.00	HC419	2	7068.00	6240.00	6
1/4-3/4	3/4	2	1-2		7	HC416				HC420				
1-2	2	5	3-5		15	HC417				HC421				
3-5	5	7-1/2	7-1/2		30	HC418				HC422				
—	—	10	10-15	2	30	HC411	2	5947.00	5309.00	HD413	2	9489.00	8328.00	6
7-1/2	10	20	20		50	HC412				HD414				

**Table 12.10: Two-Speed, Constant or Variable Torque, Full Voltage Non-Reversing**

Maximum Horsepower At				NEMA Starter Size	C/B Amp	One Winding (Consequent Pole)				Two Winding (Separate Winding)				No. of Thermal Units Required♦
208 V	240 V	480 V	600 V			Unit Type No.	Space Factor	\$ Price w/ FT▲	\$ Price w/ SY74	Unit Type No.	Space Factor	\$ Price w/ FT▲	\$ Price w/ SY74	
1/4-1/3	1/3	1	1/4-1	1	3	HC407	2	4301.00	3846.00	HC411	2	7068.00	6240.00	6
1/2-1	1	3	1-1/2-3		7	HC408				HC412				
1-1/2-3	3	7-1/2	5-10		15	HC409				HC413				
5	7-1/2	10	—		30	HC410				HC414				
5	7-1/2	15	15-20	2	30	HD405	2	5947.00	5309.00	HD408	2	9489.00	8328.00	6
7-1/2-10	10	25	25		50	HD406				HD409				
—	15	—	—		100	HD407				HD410				

- ▲ Units are wired for 480 V unless 240 V is stated on order. The 480 V control circuit transformer is reconnectable for 240 V. For other voltages, form SY74 must be used.
- Includes extra 1/2 space factor (additional space only).
- ♦ Melting alloy overload relay included; thermal units must be priced and ordered separately. If ambient compensated bimetallic overload is required add form B to unit, price adder is 170.00

**NOTE:** To get NEMA 12, multiply base price by 1.06 and add form N12 to unit.

**NOTE:** Mag-Gard® circuit breaker combination starter units through Size 4 are UL Listed for 22,000 AIR @ 600 V. **Exception:** NEMA Size 3 and 4 when bimetallic overloads are used are UL Listed for 10,000 AIR @ 600 V.

**Table 12.11: Full Voltage Non-Reversing**

Maximum Horsepower At				NEMA Starter Size	Switch Amp Rating	Unit Type No.	Space Factor	\$ Price With FT▲	\$ Price With SY74	No. of Thermal Units Required♦
208 V	240 V	480 V	600 V							
5	5	—	—	1	30	NC413	1	3345.00	3055.00	3
—	—	10	10		30	NC414				
7-1/2	7-1/2	—	—		60	NC415				
7-1/2	7-1/2	—	—	1	60	NC416	1-1/2■	4479.00	4029.00	3
—	—	10	10		30	NC417				
10	15	—	—	2	60	ND411	1	4509.00	4102.00	3
—	—	25	25		60	ND412				
10	15	—	—	2	60	ND413	1-1/2■	5197.00	4715.00	3
—	—	25	25		60	ND414				
20	25	—	—		100	NE416				
25	30	—	—	3	200	NE417	3	6228.00	5618.00	3
—	—	50	50		100	NE418				
40	50	—	—	4	200	NF409	3-1/2	10192.00	9369.00	3
—	—	100	100		200	NF410				

**Table 12.12: Full Voltage Reversing**

Maximum Horsepower At				NEMA Starter Size	Switch Ampere Rating	Unit Type No.	Space Factor	\$ Price With FT▲	\$ Price With SY74	No. of Thermal Units Required♦
208 V	240 V	480 V	600 V							
5	5	—	—	1	30	OC417	1-1/2	4744.00	4349.00	3
7-1/2	7-1/2	—	—		60	OC418				
—	—	10	10		30	OC419				
10	10	—	—	2	60	OD409	2	6069.00	5669.00	3
—	—	25	25		60	OD410				

**Table 12.13: Two-Speed, Constant Hp, Full Voltage Non-Reversing**

Maximum Horsepower At				NEMA Starter Size	Switch Amp Rating	One Winding (Consequent Pole)				Two Winding (Separate Winding)				No. of Thermal Units Required♦
208 V	240 V	480 V	600 V			Unit Type No.	Space Factor	\$ Price w/ FT▲	\$ Price w/ SY74	Unit Type No.	Space Factor	\$ Price w/ FT▲	\$ Price w/ SY74	
5	5	—	—	1	30	QC447	2	4016.00	3559.00	QC450	2	6541.00	5712.00	6
5	5	—	—		60	QC448				QC452				
—	—	7-1/2	7-1/2		30	QC449				QC452				
7-1/2	10	—	—	2	60	QD437	2	5712.00	5074.00	QD439	2	9016.00	7849.00	6
—	—	20	20		60	QD438				QD440				

**Table 12.14: Two-Speed, Constant or Variable Torque, Full Voltage Non-Reversing**

Maximum Horsepower At				NEMA Starter Size	Switch Amp Rating	One Winding (Consequent Pole)				Two Winding (Separate Winding)				No. of Thermal Units Required♦
208 V	240 V	480 V	600 V			Unit Type No.	Space Factor	\$ Price w/ FT▲	\$ Price w/ SY74	Unit Type No.	Space Factor	\$ Price w/ FT▲	\$ Price w/ SY74	
7-1/2	7-1/2	—	—	1	30	QC441	2	4016.00	3559.00	QC444	2	6541.00	5712.00	6
7-1/2	7-1/2	—	—		60	QC442				QC445				
—	—	10	10		30	QC443				QC446				
10	15	—	—	2	60	QD433	2	5712.00	5074.00	QD435	2	9016.00	8749.00	6
—	—	25	25		60	QD434				QD436				

- ▲ Units are wired for 480 V unless 240 V is stated on order. The 480 V control circuit transformer is reconnectable for 240 V. For other voltages, form SY74 must be used.
- Includes extra 1/2 space factor (additional spaces only).
- ♦ Melting alloy overload relay included; thermal units must be priced and ordered separately. If ambient compensated bimetallic overload is required add form B to unit, price adder is 170.00

**NOTE:** Refer to catalog to get NEMA 12, multiply base price by 1.06 and add form N12 to unit.

**NOTE:** Fusible starters Sizes 1-3 using Class H fuse clips have a short circuit rating of 5,000 AIR @ 600 V. Size 4 starters using Class H are rated 10 kAIR @ 600 V. If Class R fuse clips are required, order field installable kit from Digest. Fuses are not included.



This section covers Series 5600 Motor Control Center availability during product obsolescence. All Series 5600 orders can be completely defined by price, catalog type, and modifications. Layout sheets and data sheets are not required for order entry.

All unit prices are shown as NEMA 1. Note the standard features of the unit. Please refer to footnotes for important information.

**Notes:**

1. All units are circuit breaker type.
2. All starter units use Square D Type S starters and contactors.

**Telemecanique® Series 5600 History**

The Series 5600 MCC was in production for more than 20 years. In 1970 it was first sold under the ITE Circuit Breaker/ITE Imperial name. In 1976 ITE Imperial merged with Gould Inc. The MCC was then sold with the Gould ITE name and later the Gould name. In 1985 the Industrial Controls Division of Gould Inc. was sold to Telemecanique Inc., and the MCC was renamed the Telemecanique Series 5600 MCC. Telemecanique, Inc., was acquired by Groupe Schneider in 1988, and in 1991 Square D Company was purchased by Groupe Schneider.

**Transition Sections From Telemecanique Series 5600 To Square D Model 6**

Provides transition from Telemecanique Series 5600 MCC to Square D® Model 6 MCC. The transition requires an extension on the first section of the Model 6 lineup. The transition section must be ordered with at least one Model 6 section, and cannot ship separately. **The ampacity of the Model 6 bus will be equal to or greater than that of the Series 5600 bus.** 20 in. deep Model 6 can be spliced to 20 in. deep Series 5600. 15 in. deep Model 6 can be spliced to 15 in. deep Series 5600. 20 in. deep Model 6 can be spliced to 20 in. deep back-to-back Series 5600 (units mounted both front and back), with front only unit mounting on the Model 6 section(s). The transition section includes all required splice bars. (Reference Model 6 Motor Control Center Pricing Guide.)

**NOTE:** Not Available In NEMA Type 3R Construction.

The Model 6 to Series 5600 transition section is available in two basic configurations:

1. Model 6 on right spliced to Series 5600 on left
2. Model 6 on left spliced to Series 5600 on right

The following information must be provided when ordering a Model 6 to Series 5600 transition section:

1. Basic configuration (Model 6 Right/Series 5600 Left or Model 6 Left/Series 5600 Right)
2. Series 5600 bus amperage, material, plating, and dimensions
3. Model 6 bus amperage, material, and plating
4. Original Series 5600 factory order number

Please contact your local Schneider Electric sales office for price and availability of transition sections.

**Notes:**

1. Bimetallic overload relay included; thermal units must be priced and ordered separately for NEMA Sizes 1 and 2.
2. On starter units, the last digits of the unit catalog number represent the horsepower.
3. All units are NEMA 1 enclosure.
4. All units include a control power transformer and are wired for 120 V control.
5. All starter units are rated for 100 k AIR at 480 V.
6. All starter units are supplied with 1B wiring, 1 N.O. auxiliary interlock, and 1 N.C. auxiliary interlock.

**Table 12.15: Full Voltage Non-Reversing Starters**

Unit Catalog No.				NEMA Size	C/B Amps	\$ Price	Space Factor
208 V	240 V	480 V	600 V				
1TA.33	2TA.33	TA1	6TA1	1	3	3600.00	1
1TA1	2TA1	TA3	6TA3		7		
1TA3	2TA3	TA7.5	6TA10		15		
1TA5	2TA7.5	TA10	—		30		
1TA10	2TA10	TA25	6TA25	2	50	4326.00	1
1TA25	2TA30	TA50	6TA50	3	100	5632.00	2

**Table 12.16: Full Voltage Reversing Starters**

Unit Catalog No.				NEMA Size	C/B Amps	\$ Price	Space Factor
208 V	240 V	480 V	600 V				
1TC.33	2TC.33	TC1	6TC1	1	3	4816.00	1.5
1TC1	2TC1	TC3	6TC3		7		
1TC3	2TC3	TC7.5	6TC7.5		15		
1TC5	2TC7.5	TC10	6TC10		30		
1TC10	2TC10	TC25	6TC25	2	50	5796.00	1.5

**Table 12.17: 2 Speed 1 Winding Starters**

Constant Hp				Constant or Variable Torque				NEMA Size	C/B Amps	\$ Price	Space Factor
Unit Catalog No.				Unit Catalog No.							
208 V	240 V	480 V	600 V	208 V	240 V	480 V	600 V				
—	—	TH.5	6TH.75	1TE.33	2TE.33	TE1	6TE1	1	3	6572.	2
1TH.75	2TH.75	TH2	6TH2	1TE1	2TE1	TE3	6TE3		7		
1TH2	2TH2	TH5	6TH5	1TE3	2TE3	TE7.5	6TE7.5		15		
1TH5	2TH5	TH7.5	6TH7.5	1TE5	2TE7.5	TE10	6TE10		30		
1TH7.5	2TH10	TH20	6TH20	1TE10	2TE10	TE25	6TE25	2	50		2

**Table 12.18: 2 Speed 2 Winding Starters**

Constant Hp				Constant or Variable Torque				NEMA Size	C/B Amps	\$ Price	Space Factor
Unit Catalog No.				Unit Catalog No.							
208 V	240 V	480 V	600 V	208 V	240 V	480 V	600 V				
—	—	TI.5	6TI.75	1TG.33	2TG.33	TG1	6TG1	1	3	6082.00	2
1TI.75	2TI.75	TI2	6TI2	1TG1	2TG1	TG3	6TG3		7		
1TI2	2TI2	TI5	6TI5	1TG3	2TG3	TG7.5	6TG7.5		15		
1TI5	2TI5	TI7.5	6TI7.5	1TG5	2TG7.5	TG10	6TG10		30		
1TI7.5	2TI10	TI20	6TI20	1TG10	2TG10	TG25	6TG25	2	50	7510.00	2

**Table 12.19: Single Branch Circuit Breaker Feeder Units**

NOTE: All units are 3 Phase, 3 Wire

Unit Type	Trip Rating	Frame Type	\$ Price	Space Factor
TW15	15	FD	2934.00	1
TW20	20			
TW30	30			
TW40	40			
TW50	50			
TW60	60			
TW70	70			
TW80	80			
TW90	90			
TW100	100			
TW125	125	FD	6040.00	1.5
TW150	150	JD	6408.00	1.5
TW175	175			
TW200	200			
TW225	225			
TW250	250			

**Table 12.20: Dual Mounted Branch Circuit Breaker Feeder Units**

NOTE: All units are 3 Phase, 3 Wire

Unit Type	Trip Rating	Frame Type	List \$ Price	Space Factor
TW415	15/15	FD/FD	5310.00	1
TW420	20/20			
TW430	30/30			
TW450	50/50			
TW460	60/60			
TW4100	100/100			

NOTE: All circuit breaker branch feeder units are rated for 25 k AIR at 480 V.

**Table 12.21: Starter Unit Options**

Description▲	Form No.	List \$ Price
■ Start-Stop PB with 1 Pilot Light—Red (On)	AP	540.
◆ Forward-Reverse-Stop PB with 2 Pilot Lights	A1PP	1164.
★ High-Low-Stop PB with 2 Pilot Lights	A2PP	1164.
■ Hand-Off-Auto SS with 1 Pilot Light—Red (On)	CP	540.
■ 1 Pilot Light Only—Red (On)	P	286.
◆ ★ 2 Pilot Lights—Red (On)	PP	722.

- ▲ To order a unit with any of the options listed, add the form number as a suffix to the unit type number. Only listed combinations of options are available. Choose only one form number option per starter unit.
- Full Voltage Non-Reversing units only.
  - ◆ Reversing units only.
  - ★ Two-speed units only.

**Table 12.22: Misc. Units—Empty Mounting Units**

Description	Unit Type	\$ Price
1 Space Factor	TMT1	702.00
2 Space Factor	TMT2	1020.00

NOTE: (Undrilled Panel and Hinged Door)

**Table 12.23: Miscellaneous Items**

Description	Unit Type	\$ Price
1/2 Space Factor Blank Door	TBD.5	282.00
1 Space Factor Blank Door	TBD1	302.00
2 Space Factor Blank Door	TBD2	502.00
Ground Stab Kit	TGSK	152.00
1 Space Factor Unit Gasketing Kit	TGAS12	50.00
1.5 Space Factor Unit Gasketing Kit	TGAS18	76.00
2 Space Factor Unit Gasketing Kit	TGAS24	100.00

NOTE:

- All units are NEMA 1 enclosure.
- All operators and pilot lights are 22 mm.
- 1 space factor = 12 inches
- The ground stab kit is field installed and available for all units.

**QMB Fusible Panelboards**

Ready-to-Install (RTI)—600 Vac, 250 Vdc	13-2
Main Switch Replacement Units	13-3
Branch Switch Replacement	13-4
Obsolete Branch Switch Replacement Units	13-5
Series E1 Motor Starter Replacement Units	13-6

**Replacement Parts**

Trim Clamps and Screws	13-7
Circuit ID Numbers	13-7
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**NQOD Lighting and Appliance Panelboards**

Series Rated/Fully Rated Tables	13-8
Lighting and Appliance Panelboard Pricing Procedures	13-9
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Merchandised Non-Linear Panel (200% rated neutral)	13-13
Terminal Data	13-14

**Table 13.1: QMB Main Lugs Interiors, Boxes and Fronts**

Total Branch Unit Mounting Space (Inches)	Ampere Rating of Mains	\$ Price Interior, Front and Box (less units)	Component Selection				Box Height (inches)	Box Width (inches)		
			Interior Assembly—3-pole with Main Lugs		Front (4-piece Standard)				Box	
			Catalog No.	\$ Price	Catalog No.	\$ Price			Catalog No.	\$ Price
60	225	3478.	QMB60902	2631.	QM38902TS	590.	QM3890B	257.	90	38
45	400	3954.	QMB45754	2894.	QM38756TS	803.	QM3875B			
45	600	4484.	QMB45756	3540.	QM38756TS	687.	QM3875B			
45	800	5448.	QMB45908	4304.	QM38908TS	887.	QM3890B	257.	90	38
45	1200	6313.	QMB459012	5169.	QM389012TS		QM3890B			
60	600	6093.	QMB60906	4949.	QM38906TS		QM3890B			

**Table 13.2: QMB Main Switch Interiors, Boxes and Fronts**

Total Branch Unit Mounting Space (Inches)	Ampere Rating of Mains	Maximum Voltage (ac)	\$ Price Interior, Front and Box (less units)	Component Selection				Box Height (inches)	Box Width (inches)		
				Interior Assembly—3-pole with Main Switch		Front (4-Piece Standard)				Box	
				Catalog No.	\$ Price	Catalog No.	\$ Price			Catalog No.	\$ Price
51	200	240	4551.	QMB5190324M	3704.	QM38902TS	590.	QM3890B	257.	90	38
45	400		10173.	QMB4590325M	9029.	QM38906TS	887.	QM3890B			
45	600		12118.	QMB4590326M	10974.						
51	200	600	5332.	QMB5190364M	4485.	QM38902TS	590.	QM3890B	257.	90	38
45	400		10834.	QMB4590365M	9690.	QM38906TS	887.	QM3890B			
45	600		12940.	QMB4590366M	11796.						

**Table 13.3: Accessories**

Blanks			Solid Neutral Assembly		
Height	Catalog No.	\$ Price	Ampere Rating	Catalog No.	\$ Price
1.5	QMB1BLW	75.	225	QMB2SN	380.
3	QMB3BLW	80.	400	QMB4SN	477.
6	QMB6BLW	87.	600	QMB6SN	599.
15	QMB15BLW	120.	800	QMB8SN	969.
—	—	—	1200	QMB12SN	1545.

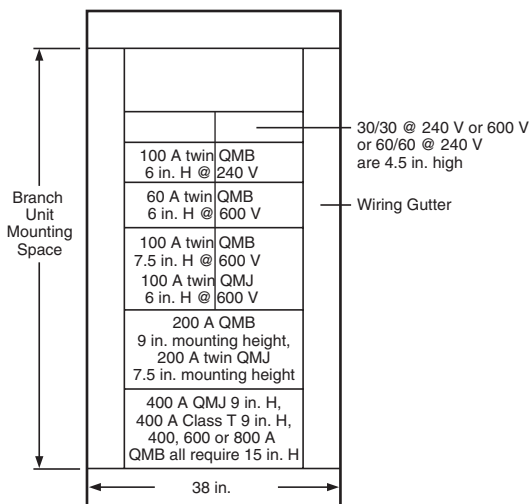
Note: Equipment Ground Bar—PK32DGTA, price: \$104.00

**Table 13.4: QMB Branch Circuit Breaker Units 600 Vac**

Unit Ampere Rating	Unit Height (Inches)	Catalog No.	\$ Price	Description
15–100	6	QMBHW ▲ ■	1965.	Mounts (1) or (2) 3-pole HDL circuit breakers
110–225	6	QMBJW ▲ ◆	2099.	Mounts (1) 3-Pole JDL circuit breaker
400	7.5	QMB3400LAW ★	5445.	Includes (1) 3-Pole LAL circuit breaker

- ▲ Circuit breakers not included. Order HDL or JDL circuit breakers from Digest page 7-22.
- Order one catalog number S37444 for each circuit breaker.
- ◆ Order catalog number S37445 with QMBJW.
- ★ For trip ratings other than 400 A, contact your nearest Schneider Electric sales office.

**QMB Layout Information**



**Table 13.5: Main Switch Replacement Units (Replaces Series E1)**

Ampere Rating	Standard—Class H, R, K Fuse Spacing		Class T Fuse Spacing		Class J Fuse Spacing	
	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
<b>3-Pole, 240 Vac</b>						
100	QMB323MW	2208.	—	—	—	—
200	QMB324MW	2208.	—	—	—	—
400	QMB325MW	6923.	—	—	—	—
600	QMB326MW	8561.	—	—	—	—
800	—	—	—	—	—	—
<b>3-Pole, 600 Vac</b>						
100	QMB363MW	2891.	—	—	—	—
200	QMB364MW	2891.	—	—	—	—
400	QMB365MW	7616.	{ QMB365MW▲	7616.	{ QMB365MW▲	7616.
			QMB400T6	275.	QMB400J	530.
600	QMB366MW	9417.	{ QMB366MW▲	9416.	{ QMB366MW▲	9416.
			QMB600T6	291.	QMB600J	591.
800	QMB367MW	16974.	{ QMB367MW▲	16974.	—	—
			QMB800T6	701.	—	—

▲ Both catalog numbers are required for a complete device.

Example: { QMB365MW  
QMB400T6 constitutes a complete device.

**Table 13.6: Main Switch Interior Lug Data**

Mechanical Lugs				VCEL Compression Lugs			
Mains Ampere Rating	Conductors Per Phase	Wire Range Wire Bending Space per NEC Table 373-6	Lug Wire Range	Conductors Per Phase	Wire Range Wire Bending Space per NEC Table 373-6	Catalog No.	Lug Wire Range
200	(1)	#6–300 kcmil Al or Cu	#6–300 kcmil Al or Cu	(1)	#4–300 kcmil Al or Cu	VCEL030516H1	#4–300 kcmil Al or Cu
400	(2)	3/0–500 kcmil Al or Cu	3/0–600 kcmil Al or Cu	(2)	2/0–600 kcmil Al or Cu	VCEL05012H1	2/0–500 kcmil Al or Cu
						VCEL06012H1	400–600 kcmil Al or Cu
						VCEL07512H1	500–750 kcmil Al
600	(2)	3/0–500 kcmil Al or Cu	3/0–600 kcmil Al or Cu	(2)	2/0–500 kcmil Al or Cu	VCEL05012H1	3/0–500 kcmil Al or Cu
800■	(3)	3/0–500 kcmil Al or Cu	3/0–600 kcmil Al or Cu	(3)	2/0–500 kcmil Al or Cu	VCEL05012H1	3/0–500 kcmil Al or Cu

■ Factory assembled only.

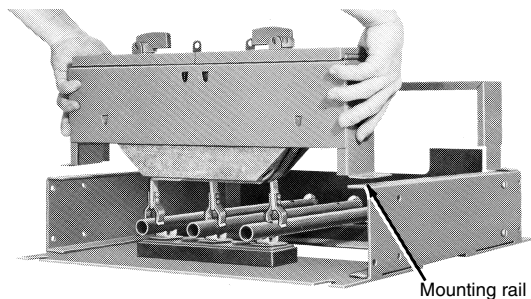
**Guidelines**

**STEP 1:** Determine the panelboard interior type. If the date of manufacture is not known, compare your switch with the pictures below to determine the mounting rail direction. Only mounting rails that face outward will accept the Series D2 switch and its required mounting rail extension bracket.

**STEP 2:** Order a replacement switch from page 13-5.

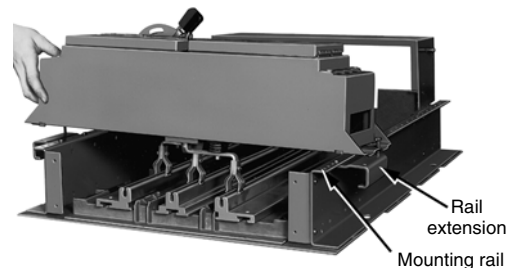
**Table 13.7: Panelboard Interiors**

Illustration No.	Interior Catalog No. Prefix	Designed For Switch Type	Switch Availability/Order Information
1.	Type QM in 31-inch wide box built before 1961.	Series 1-4 30-200 A Maximum	NOT AVAILABLE Series D2 switches are not compatible replacements for this application.
2.	Type QM in 31-inch wide box built after 1961 and before 1984.	Series 1-4 30-200 A Maximum	NOT AVAILABLE Order Series D2 switch from page 13-5.
		Series D2 30-200 A Maximum	Order Series D2 switch from page 13-5. (Many still stocked in DS.)
3.	Type QW in 38-inch wide box built before 1984.	Series 1-4 30-200 A Maximum	NOT AVAILABLE Order Series D2 switch and plug-on extension assembly from page 13-5.
		Series 1-4 400-600 A	NOT AVAILABLE QMB3400LA available order only from Lexington.
		Series D2 30-200 A Maximum	Order Series D2 switch and plug-on extension assembly from page 13-5.
4.	Type QMB in 35-inch or 38-inch wide box built after 1984.	Series E1 or E2 30-800 A	Order from Digest page 9-34.



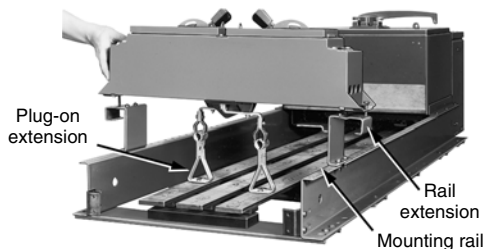
Type QM (31-inch Wide)  
Manufactured Before 1961

Panelboards manufactured before 1961 have the interior mounting rails facing inward (toward the bus). Switches and circuit breakers that fit in this interior type are obsolete.



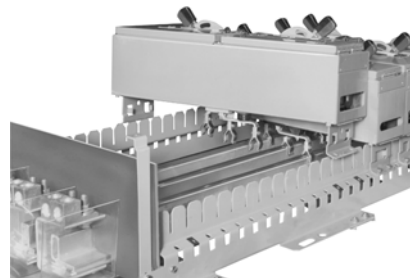
Type QM (31-inch Wide)  
Manufactured After 1961 But Before October 1984

Panelboards manufactured after 1961 have the interior mounting rails facing outward (away from the bus). This interior accepts Series 1-4 switches and Series D2 switches (shown above with required rail extensions). Order the Series D2 switch (includes mounting rail extensions) from page 13-5.



Type QW (38-inch Wide)  
Manufactured Before 1984

Type QW panelboards were built to accept bolt-on 400 A and 600 A Series 1-4 switches. 30-200 A Series D2 switches may be installed as shown using the plug-on extension assembly from page 13-5.



Type QMB  
Manufactured After October 1984

Series E1 panelboards will accept only Series E1 or E2 switches. Order from Digest page 9-34.

**30–200 A Obsolescent Switch Units—Series D2**

Available In DS Stock, except where noted.

All Series D2 switches require that rail extension assemblies be attached to the interior side rails in order to mount the switch. These rail extension assemblies are packaged with every Series D2 switch. If a rail extension is lost or missing, contact your nearest Schneider Electric sales office to order a replacement.

Plug-on extension assemblies must also be ordered when installing 30–200 A plug-on units in blank spaces of a QW interior in the 38-inch wide box. These plug-on extension assemblies (which extend the bus) are NOT the same as the rail extension assemblies packaged with every Series D2 switch (which extend only the mounting rails).

**Table 13.8: Branch Units—Three Pole**

Ampere Rating	Unit Height (inches)	Obsolescent ▲ Series 1–4 Catalog No.	Replaced By Series D2 Catalog No.	\$ Price	Class R Fuse Kits		
					No. Kits Req'd.	Catalog No.	\$ Price
240 Vac							
30-30	4.50	QMB3203T	QMB321T■	1139.	2	HRK30	26.
60-60	4.50	QMB306T	QMB322TD	1187.	1	QMB36R	49.
100-100	6.00	QMB310T	QMB323TD	1808.	1	QMB100R	95.
200	9.00	QMB3220	QMB324	2393.	1	HRK1020	48.
600 Vac							
30-30	4.50	QMB3603T	QMB361T■	1763.	1	QMB36R	49.
30-30	6.00		QMB362T1				
60-60	6.00	QMB3606T	QMB362T	1763.	1	QMB60R	49.
100-100	7.50	QMB3610T	QMB363T	2795.	2	HRK1020	48.
200	9.00	QMB3620	QMB364	3297.	1		

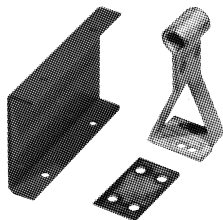
- ▲ These switch units are no longer available; the catalog number is provided only for cross referencing to Series D2 units.
- When this Series D2 switch is used as a replacement for a Series 1-4 3-inch switch, a blank filler plate is also required. Purchase the blank filler plate from a local sheet-metal fabricator. If a drawing of this part is required, contact Peru TAG.

**Table 13.9: Obsolescent Circuit Breaker Units ▲**

Catalog No.	\$ Price
QMB3400LA■	7097.

- ▲ Circuit breaker units are designed for use in all QMB interior types manufactured between 1961 and October 1984.
- Includes a 3-pole, LA type circuit breaker. For other ampere ratings, contact the Schneider Electric Customer Information Center.

**Table 13.10: Plug-On Extension Assemblies ▲**



Plug-On Extension Assembly

Ampere Rating	Switch Mounting Height (inches)	Catalog No.	\$ Price
30-30 Switch	3	QMB303LEX	203.
30-30 Switch	4.5	QMB306LEX	207.
30-30 Switch	6	QMB306EX	239.
60-60 Switch	4.5	QMB306LEX	207.
60-60 Switch	6	QMB306EX	239.
100-100 Switch	6	QMB310LEX	239.
100-100 Switch	7.5	QMB310EX	567.
200 Switch	9	QMB320EX	567.
LA Circuit Breaker	7.5	QMB310EX	

- ▲ Bus extensions are required on all 30–200 A switches. They are also required on all circuit breaker units used in switchboards or in QW type panelboards with a 38-inch wide box.

**Table 13.11: Obsolescent Main Switch Units ▲**

Ampere Rating	Unit Height (inches)	Catalog No.	\$ Price	Replaces Series 4 Unit Catalog No.
3-pole 240 Vac				
100	9	QMB323M■	2303.	QMB3210M
200		QMB324M		QMB3220M
3-pole 600 Vac				
100	9	QMB363M■	3017.	QMB3610M
		QMB363MJ■	3213.	QMB3610MJ
200	9	QMB364M	3792.	QMB3620M
		QMB364MJ■	4038.	QMB3620MJ

- ▲ Replace Series 4 Units
- Order only from the Lexington plant.

**Application**

For use on three-phase AC systems—208, 240, or 480 volts. UL® Listed.

**Starters**

Line Voltage Type

- Non-Reversing—Twin Units
  - Sizes 0 through 3—Class 8536, Types SB, SC, SD and SE.
- Reversing—Single Units
  - Sizes 0 through 3—Class 8736, Types SB, SC, SD and SE.

**Table 13.12: Starter Units—Not stocked in DS. Order only from the Peru plant.**

NEMA Size	Coil Voltage ♦	Class 8536—Types SB, SC, SD and SE▲ Type S—Non-Reversing (see Digest page 16-16)			Class 8736—Type SB, SC, SD and SE ▲ Reversing (see Digest page 16-51)		
		Unit Height (Inches)	Twin-Starter Unit (Two Non-Reversing Starters)	\$ Price ■	Unit Height (Inches)	Single-Starter Unit (One Reversing Starter)	\$ Price ■
			Catalog No.			Catalog No.	
0	120	9	QMS8536100120W	1931.	9	QMS873610120W	2115.
	208		QMS8536100208W			QMS873610208W	
	240		QMS8536100240W			QMS873610240W	
	480		QMS8536100480W			QMS873610480W	
1	120	9	QMS8536111120W	2435.	9	QMS873611120W	2295.
	208		QMS8536111208W			QMS873611208W	
	240		QMS8536111240W			QMS873611240W	
	480		QMS8536111480W			QMS873611480W	
2	120	10-1/2	QMS8536222120W	3813.	10-1/2	QMS873622120W	3732.
	208		QMS8536222208W			QMS873622208W	
	240		QMS8536222240W			QMS873622240W	
	480		QMS8536222480W			QMS873622480W	
3	120	18	QMS8536333120W	5930.	18	QMS873633120W	6797.
	208		QMS8536333208W			QMS873633208W	
	240		QMS8536333240W			QMS873633240W	
	480		QMS8536333480W			QMS873633480W	

- ▲ Space and drilling are provided for field addition of control voltage transformer and fuse base.
- Prices include starters, but do not include overload relay thermal units. See Digest page 16-129 for selection procedure (AC magnetic starters—small enclosure), and order thermal units separately.
- ♦ See Digest page 16-21 for maximum motor starter ratings.

**Table 13.13: UL Listed Short Circuit Ratings @ 600 V Maximum**

Starter Size	Fusible Switch (with Class R or J fuse) RMS Sym. Amperes	Thermal-Magnetic Circuit Breaker RMS Sym. Amperes
0	100,000	5,000
1		
2		
3		

**Selection of Components**

1. List required motor starter units (reversing or non-reversing) from the tables above.
2. Specify the HP, voltage, phase, frequency and full load current rating of the motor.
3. Specify the unit mounting space.
4. Determine the circuit breaker or fusible switch rating for motor branch circuits from the selection tables on Digest page 9-34.
5. For motor starter voltages other than standard voltages of 120, 208, 240 and 480 volts, contact your nearest Schneider Electric sales office.

**Starter Data**

- Line voltage coils are furnished as standard on all starters.
- Twistouts are provided in starter covers for start-stop push buttons, selector switches and pilot lights. See accessories table below.
- Starter door interlocks are furnished with motor starter enclosures.
- Type S starter enclosures include drillings for the next smaller size.
- All Type S starters have provisions for three overload relay thermal units, as required by NEC® Table 430.37 for three phase ac motor circuits.

**Accessories**

Accessories listed below are available for field installation on all units. Go to the page numbers shown for prices.

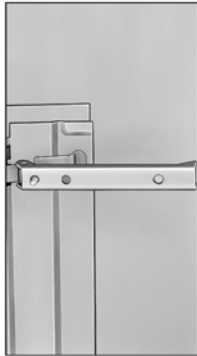
**Table 13.14: Field Installable Accessories**

Description	Digest Page No.
Push Buttons and Selector Switches: Class 9001, Type K	19-55 through 19-64
Pilot Lights: Class 9001, Type KP	19-65
Electrical Interlocks: Class 9999, Type SX6, SX7	16-123
Industrial Control Transformers: Class 9070	Supplemental Digest 6-5
Type EO1; Starter Size: 0 and 1, Non-Reversing	
Type EO2; Starter Size: 0, 1 and 2, Reversing	
Type EO3; Starter Size: 3	
Type EO4; Starter Size: 4	
Control Circuit Fuse Block: Class 9080, Type PF1	24-20



QMB Motor Starter Panelboard





Catalog No.  
PK3TC

**Table 13.15: Trim Clamps and Screws**

Application	Catalog No.	\$ Price
NEHB Panelboards: All fronts up through 400 A	PK3TC	44.

**Table 13.16: Circuit I.D. Numbers**

Circuit Number Description	NEHB and NEHB Column Width Catalog No.	\$ Price
1 through 54	8004332501	14.

**Table 13.17: Locks—Type 1 Enclosures**

Application	Catalog No.	\$ Price
<b>NEHB Panelboards</b>		
All main lug fronts and all main circuit breaker fronts up to 225 A	PK4FL	90.
All 400 A main circuit breaker fronts	PK5FL	165.
<b>Telephone Cabinets</b>		
Fronts on boxes up to 30 inches wide	PK4FL (Before November 1997)	90.
Fronts on boxes 36 inches or wider	PK22FL (After November 1997) PK5FL	165.



Catalog No.  
PK4FL



Catalog No.  
PK5FL



This page contains UL Tested and Certified series combination ratings for panelboards. These ratings apply to either an integral main located in the same enclosure or a remote main located in a separate enclosure. NOTE: Where QO(B) GFI circuit breakers are shown above, QO (B) EPD circuit breakers may also be used.

Table 13.18: NQOD Series Ratings

Maximum System Voltage AC ♦	Maximum Short Circuit Current Rating (RMS Sym.)	Integral or Remote Main Circuit Breakers and Remote Main Fuses	Branch Circuit Breaker Designations and Allowable Ampere Ranges ▲ ■					
			Type	1-pole	2-pole	3-pole		
120/240 1Ø		MG	QO (B)	15-30 A	—	—		
			42k	HD, JD	QO (B) PL	15-30 A	15-60 A	15-30 A
			65k	HG, JG				
			100k	HJ, JJ				
			125k	HL, JL				
120/240 1Ø 208Y/120	100k	DJ 400 A	QO (B)	15-70 A	15-125 A	—		
			QO (B) GFI	15-30 A	40-60 A	—		
			QO (B) VH	—	150 A	15-150 A		
			QO (B) AFI	15-20 A	—	—		
			QO (B)	15-70 A	15-125 A	15-30 A		
		QJ	QO (B) AS	15-30 A	15-30 A	15-30 A		
			QO (B) GFI	15-30 A	15-60 A	—		
			QO (B) PL	15-30 A	15-60 A	15-30 A		
			QO (B) VH	—	150 A	35-150 A		
			QO (B) AFI	15-20 A	—	—		
			QO (B)	15-70 A	—	—		
208Y/120	18k	LA/LH (L) 34200MC, LA/LH (L) 34225MC, LA/LH (L) 34250MC, LA/LH (L) 34400MC	QO (B)	15-30 A	15-30 A	15-30 A		
			QO (B)	15-70 A	15-125 A	15-100 A		
240	22k	QO (B) VH	QO (B) AS	15-30 A	15-30 A	15-30 A		
			QO (B) GFI	15-30 A	15-60 A	—		
			QO (B) PL	15-30 A	15-30 A	—		
			QO (B) AFI	15-20 A	—	—		
			QO (B)	15-70 A	15-100 A	15-30 A		
		Q2-HΔ	QO (B) GFI	15-30 A	15-30 A	—		
			QO (B) AFI	15-20 A	—	—		
		240	25k	QD	QO (B)	15-70 A	15-125 A	15-30 A
					QO (B) AS	15-30 A	15-30 A	15-30 A
					QO (B) GFI	15-30 A	15-60 A	—
					QO (B) PL	15-30 A	15-60 A	15-30 A
QO (B) VH	—				150 A	35-150 A		
QO (B) AFI	15-20 A			—	—			
ED, FDΔ	QO (B)			15-70 A	15-125 A	15-100 A		
	QO (B) GFI			15-30 A	15-60 A	—		
	QO (B) AFI			15-20 A	—	—		
KDΔ	QO (B)			15-70 A	15-125 A	15-100 A		
	QO (B) AS			15-30 A	15-30 A	15-30 A		
	QO (B) GFI			15-30 A	15-60 A	—		
	QO (B) AFI			15-20 A	—	—		
	QO (B)			15-70 A	15-125 A	15-100 A		
HD, JD	QO (B) VH	—	—	35-150 A				
	QO (B) GFI	15-30 A	15-60 A	—				
	QO (B) AFI	15-20 A	—	—				
	QO (B) H	—	15-100 A	—				
	QOB2150VH	—	150 A	—				
240	42k	LA, MA	Q2L-HΔ	—	110-225 A	110-225 A		
			QDL	—	70-225 A	70-225 A		
		MG	QO (B) VH	15-30 A	15-30 A	15-30 A		
			QO (B) PL	15-30 A	15-60 A	15-30 A		
		HD, JD	QO (B)	15-70 A★	—	—		
			QO (B) VH	15-30 A	15-125 A	15-100 A (3P 208 V Max.)		
		LC 600 A Maximum	QO (B) GFI	15-30 A▼	15-60 A	—		
			QO (B) AFI	15-20 A	—	—		
		240	65k	LC 600 A Maximum	QO (B) VH	15-30 A	15-125 A	15-100 A (3P 208 V Max.)
					QO (B) GFI	15-30 A▼	—	—
QO (B) AFI	15-20 A			—	—			
DJ 400 A	QO (B)			15-70 A	15-125 A	—		
	QO (B) VH			—	150 A	15-150 A		
QO (B) H	—			—	15-100 A	—		
	QO (B)			15-70 A	15-125 A	15-100 A		
EG, FGΔ, KGΔ	QO (B) GFI			15-30 A	15-60 A	—		
	QO (B) AFI			15-20 A	—	—		
	QO (B)			15-70 A	15-125 A	15-30 A		
QG	QO (B) AS			15-30 A	15-30 A	15-30 A		
	QO (B) VH			—	—	35-150 A		
	QO (B) GFI			15-30 A	15-60 A	—		
QG, HG, JG	QO (B) PL			15-30 A	15-60 A	15-30 A		
	QO (B) AFI			15-30 A	—	—		
	QO (B)			15-70 A	15-125 A	15-100 A		
HG, JG	QO (B) VH			—	—	35-150 A		
	QO (B) H			—	15-100 A	—		
	QOB2150VH			—	150 A	—		
	QO (B)			15-70 A	15-100 A	15-100 A		
	QO (B) AS			15-30 A	15-30 A	15-30 A		
FC22 KC22 FC32 KC32	QO (B) GFI			15-30 A	15-30 A	—		
	QO (B) AFI	15-20 A	—	—				
	QO (B) VH	15-30 A	15-125 A	15-100 A				
	QOB-VH	—	150 A	—				
	QO (B) AFI	15-20 A	—	—				
240	100k	FC24 KC24 FC34 KC34	QO (B)	15-70 A	15-100 A	15-100 A		
			QO (B) AS	15-30 A	15-30 A	15-30 A		
			QO (B) GFI	15-30 A	15-30 A	—		
			QO (B) AFI	15-20 A	—	—		
			QO (B) AFI	15-20 A	—	—		
		200 A Max. Class T3 Fuses	QO (B) AFI	15-20 A	—	—		
			QO (B)	15-70 A	15-125 A	15-100 A		
		EJ, FJΔ	QO (B) GFI	15-30 A	15-60 A	—		
			QO (B) AFI	15-20 A	—	—		
		HJ, JJ	QO (B)	15-70 A	15-125 A	15-100 A		
			QO (B) VH	—	—	35-150 A		
240	125k	HL, JL	QO (B) GFI	15-30 A	15-60 A	—		
			QO (B) PL	15-30 A	15-60 A	15-30 A		
			QO (B) AFI	15-20 A	—	—		
240	200k	FI, KI	QO (B) H	—	15-100 A	—		
			QOB2150VH	—	150 A	—		
			QO (B)	15-70 A	15-125 A	15-100 A		
		QO (B) AS	15-30 A	15-30 A	15-30 A			
		QO (B) GFI	15-30 A	15-60 A	—			
		QO (B) AFI	15-20 A	—	—			
Maximum Fuses 200 A Class J or T6 400 A Class T3	QO (B)	15-70 A	15-125 A	15-100 A				
	QO (B) AS	15-30 A	15-30 A	15-30 A				
	QO (B) GFI	15-30 A	15-60 A	—				

▲ Suffixes HID, SWD and SWN may also be applied to the applicable branch circuit breakers shown above, except suffix SWN may NOT be applied in combination with LC main circuit breakers.  
 ■ Where QO (B) circuit breakers are shown above, QO (B) H, QO (B) VH, and QH (B) circuit breakers may also be used.  
 ♦ For shown circuit breakers rated less than this maximum voltage, the indicated short circuit current rating also applies, but at the voltage rating of the circuit breaker.  
 ★ Only 15-30 A circuit breakers may be used when the LC circuit breaker is rated 450, 500 or 600 A.  
 ▼ Circuit breakers may not be used when the LC circuit breaker is rated 450, 500 or 600 A.  
 Δ Obsolete. Contact the Square D/Schneider Electric local Field Sales Office for the replacement circuit breaker. One-pole FJ circuit breakers are still available.

**NQOD Merchandised Pricing Procedure**

1. List circuit breakers required, either plug-on or bolt-on. See appropriate pages for catalog numbers.
2. Determine equivalent number of pole spaces required.
3. Select proper main lugs interior or main lugs interior and main circuit breaker adapter kit based on equivalent number of poles and ampere rating from appropriate page. Interiors include solid neutral and are field convertible to top feed.
4. Select enclosure from appropriate page.  
Type 1—Select box and front catalog number corresponding to interior catalog number. Type 3R, 5, 12—Select enclosure, front included.
5. For complete price, add the component prices. Include panelboard accessories.
6. Apply appropriate discount schedule.

**NQOD Merchandised Example:**

**Table 13.19: 208Y/120 Vac, 3Ø4W, 10 kAIR, 225 A, MLO, Type 1 surface mount, bolt-on branch circuit breakers, main sub-feed lugs. ▲**

Branches	Page No.	Catalog Number	Spaces	\$ Price
225 A MLO Interior	13-10	NQOD430L225CU	30	1292.
Box	13-10	MH32	—	113.
Cover	13-10	MHC32S	—	497.
Main Sub-Feed Lugs	13-10	NQOD225SFL	—	203.
			Total Price	2105.

▲ Price branch breakers from page 9-10 of the current Digest.

**13 OBSCOLESCENT PANELBOARDS**

**Table 13.20: Main Lug Interiors—Accepts plug-on and bolt-on circuit breakers**

Max. No. of Single Pole QO/QOB Circuit Breakers	Mains Rating	Total Price Interior Front and Enclosure		Interior Only (Order Branch Circuit Breakers Separately)		Type 1 Enclosure				Type 3R, 5, 12 Enclosure <sup>Δ</sup>		Height (In.)
		Type 1	Type 3R, 5, 12	Catalog No. <sup>▲</sup>	Price	Box 20"W x 5.75"D■		MONO-FLAT <sup>®</sup> Front♦		Enclosure 20"W x 6.5"D		
						Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	
<b>20" Wide Cabinet—Single Phase 3-Wire</b>												
20	100	1417.	3050.	NQOD20L100CU	864.	MH23	113.	MHC23 ( )	440.	MH23WP	2186.	23
30	225	1789.	3383.	NQOD30L225CU	1179.	MH32	113.	MHC32 ( )	497.	MH32WP	2204.	32
42		2037.	3623.	NQOD42L225CU	1418.	MH35	113.	MHC35 ( )	506.	MH35WP	2205.	35
42		2464.	4021.	NQOD42L225CUTF▼	1799.	MH41	113.	MHC41 ( )	552.	MH41WP	2222.	41
54		2278.	3835.	NQOD54L225CU	1613.	MH41	113.	MHC41 ( )	552.	MH41WP	2222.	41
30	400	2483.	4346.	NQOD30L400CU	1737.	MH50	113.	MHC50V ( )	633.	MH50WP	2609.	50
42		2671.	4512.	NQOD42L400CU	1896.	MH53	113.	MHC53V ( )	662.	MH53WP	2616.	53
54		2894.	4737.	NQOD54L400CU	2085.	MH53	113.	MHC53V ( )	662.	MH53WP	2616.	53
30		2638.	4605.	NQOD30L600	1863.	MH53	113.	MHC53V ( )	662.	MH53WP	2616.	53
42	600★	2807.	4767.	NQOD42L600	2019.	MH56	113.	MHC56V ( )	675.	MH686WP	2748.	56/68
42		3768.	5699.	NQOD42L600TFL▼	2942.	MH62	113.	MHC62V ( )	713.	MH746WP	2757.	62/74
42		2991.	4922.	NQOD54L600	2165.	MH62	113.	MHC62V ( )	713.	MH746WP	2757.	62/74
54												
<b>20" Wide Cabinet—Three Phase 4-Wire</b>												
24	100	1615.	3248.	NQOD42L100CU	1062.	MH23	113.	MHC23 ( )	440.	MH23WP	2186.	23
30	225	1769.	3383.	NQOD430L100CU	1191.	MH26	113.	MHC26 ( )	465.	MH26WP	2192.	26
30		1902.	3496.	NQOD430L225CU	1292.	MH23	113.	MHC32 ( )	497.	MH32WP	2204.	32
42		2170.	3756.	NQOD442L225CU	1551.	MH35	113.	MHC35 ( )	506.	MH35WP	2205.	35
42		2567.	4124.	NQOD442L225CUTF▼	1902.	MH41	113.	MHC41 ( )	552.	MH41WP	2222.	41
54	400	2378.	3935.	NQOD454L225CU	1713.	MH41	113.	MHC41 ( )	552.	MH41WP	2222.	41
30		2726.	4589.	NQOD430L400CU	1980.	MH50	113.	MHC50V ( )	633.	MH50WP	2609.	50
42		2908.	4749.	NQOD442L400CU	2133.	MH53	113.	MHC53V ( )	662.	MH53WP	2616.	53
54		3091.	4934.	NQOD454L400CU	2282.	MH59	113.	MHC59V ( )	696.	MH59WP	2652.	59
30	600★	2916.	4883.	NQOD430L600	2141.	MH53	113.	MHC53V ( )	662.	MH656WP	2742.	53/65
42		3062.	5022.	NQOD442L600	2274.	MH56	113.	MHC56V ( )	675.	MH686WP	2748.	56/68
42		4050.	5981.	NQOD442L600TFL▼	3224.	MH62	113.	MHC62V ( )	713.	MH746WP	2757.	62/74
54		3279.	5210.	NQOD454L600	2453.	MH62	113.	MHC62V ( )	713.	MH746WP	2757.	62/74

- ▲ "CU" suffix indicates copper bussing. NQOD RTI interiors with aluminum bus are no longer available. Order the copper bussed equivalent with a "CU" suffix when ordering a replacement interior.
- Embossed mounting holes add a .25 inch standoff to back of MH box.
- ♦ Add "F" for flush, "S" for surface.
- ★ Copper bus standard on 600 A interiors.
- ▼ Feed-thru lug interior.
- Δ Enclosure includes trim kit.
- 42 circuit MLO panelboard requires MH38 box, 54 circuit panelboard requires MH44 box.

**Table 13.21: NQOD Accessories**

Description	Catalog No.	\$ Price	Schedule
<b>Sub-feed lug kits—main lugs only—1Ø or 3Ø □</b>			
• 100 A	NQOD100SFL	155.00	PE1A
• 225 A	NQOD225SFL	203.00	PE1A
<b>Sub-feed: Bolt-on: 2-pole</b>			
• 3-pole	QOB2125SL	176.00	DE2
• 3-pole	QOB3125SL	176.00	DE2
<b>Equipment ground bars: 12 circuit 225 A max.</b>			
• 20 circuit 225 A max.	PK9GTA	13.00	DE3A
• 24 circuit 225 A max.	PK12GTA	16.00	DE3A
• 24 circuit 225 A max.	PK15GTA	17.00	DE3A
• 30 circuit 225 A max.	PK18GTA	19.00	DE3A
• 54 circuit 225 A max.	PK23GTA	21.00	DE3A
• 54 circuit 600 A max.	PK27GTA	34.00	DE3A
• PK15GTA with #1 to 4/0 Al/Cu lug	PK15GTAL	35.00	DE3A
• PK18GTA with #1 to 4/0 Al/Cu lug	PK18GTAL	38.00	DE3A
• PK23GTA with #1 to 4/0 Al/Cu lug	PK23GTAL	41.00	DE3A
<b>Ground bar insulator kit</b>	PKGTAB	44.00	DE3A
<b>Filler plate</b>	QOFF	3.60	DE2A
<b>Circuit I.D. number strips</b>			
1-102 odd/even (left side numbered 1,3,5 ... 101)	NQ102OE	8.00	PE1A
103-204 odd/even (left side numbered 103,105,107 ... 203)	NQ204OE	8.00	PE1A
1-102 sequential (left side numbered 1,2,3 ... 102)	NQ102S	8.00	PE1A
103-204 sequential (left side numbered 103,104,105 ... 204)	NQ204S	8.00	PE1A
<b>Directory cards</b>	8003115801	5.00	PE1A
<b>Plastic stick-on directory pouch</b>	8003115901	14.00	PE1A
Lock - for MONO-FLAT fronts	PK22FL	93.00	PE1A
Key—NSR-251 (for all locks)	LP9618	29.00	PE1A
Touch-up paint USAS #49 Gray (Aerosol can)	PK49SP	39.00	DE1
<b>Handle attachments—branch circuit breakers:</b>			
• Handle lock-off	HLO1	9.90	DE2E
• Handle tie - (QO and QOB only)	QO1HT	3.80	DE2E
• Handle padlock attachment - 1-pole	QO1PA	10.70	DE2E
• 2- and 3-pole	QO1PL	10.70	DE2E
• Combination handle tie and lock-off for three 1-pole (QO, QOB)	QO3HT	13.40	DE2E
<b>Neutral or Ground Lugs: #10 to #2 Al or #14 to #4 Cu</b>			
• #4 to #1/0 Al/Cu	QO70AN	9.90	DE2E
• #1 to #4/0 Al/Cu	Q1100AN	11.10	DE2E
• #1 to #4/0 Al/Cu	Q1150AN	32.40	DE2E
<b>Endwalls for MH Boxes</b>			
• Blank	8011010501	41.00	PE1A
• With Knockouts	8011010401	41.00	PE1A
<b>Elevating Nuts (4 required)</b>	2322000003	1.30	PE1A

**NOTE:** For Door-in-door (hinged) trim see the Supplemental & Obsolescence Digest, Section 4.

**Table 13.22: Main Circuit Breaker Interiors—Accepts plug-on and bolt-on circuit breakers**

Max. No. of One-pole QO QOB Circuit Breakers	Mains Rating	Total Price Interior, Front, Box and Adapter Kit		Main Circuit Breaker Adapter Kit Catalog No. Price	Interior Only (Order Branch Circuit Breakers Separately) Catalog No. ▲ Price	Type 1 Enclosure				Type 3R, 5, 12 Enclosure ★		Height (In.)	
		Type 1	Type 3R, 5, 12			Box 20"W x 5.75"D ■		MONO-FLAT® Front ♦		Enclosure 20"W x 6.5"D			
						Catalog No.	\$ Price	Catalog No.	Price	Catalog No.	\$ Price		
<b>20" Wide Cabinet—Single Phase 3-Wire</b>													
20	100	2024.	3638.	Factory Installed Backfed QOB Main Circuit Breaker	NQOD20M100CU	1446.	MH26	113.	MHC26 ( )	465.	MH26WP	2192.	26
30	225	2662.	4562.		NQODQB▼ or NQODJK▼ \$780.	NQOD30L225CU	1179.	MH44	113.	MHC44 ( )	590.	MH44WP	2603.
42		2944.	4807.	NQOD42L225CU		1418.	MH50	113.	MHC50 ( )	633.	MH50WP	2609.	50
42		3367.	5231.	NQOD42L225CUTFΔ		1799.	MH56	113.	MHC56 ( )	675.	MH56WP	2652.	56
54		3181.	5045.	NQOD54L225CU		1613.	MH56	113.	MHC56 ( )	675.	MH56WP	2652.	56
30	400	3362.	5259.	NQOD4▼ \$780.	NQOD30L400CU	1737.	MH65	113.	MHC65V ( )	732.	MH65WP	2742.	65
42		3545.	5418.		NQOD42L400CU	1896.	MH68	113.	MHC68V ( )	756.	MH68WP	2742.	68
42		4612.	6479.		NQOD42L600TFLΔ	2942.	MH77	113.	MHC77V ( )	777.	MH77WP	2757.	77
54		3746.	5622.		NQOD54L400CU	2085.	MH74	113.	MHC74V ( )	768.	MH74WP	2757.	74
<b>20" Wide Cabinet—Three Phase 4-Wire</b>													
24	100	2437.	4051.	Factory Installed Backfed QOB Main Circuit Breaker	NQOD424M100CU	1859.	MH26	113.	MHC26 ( )	465.	MH26WP	2192.	26
30		2575.	4178.		NQOD430M100CU	1985.	MH29	113.	MHC29 ( )	477.	MH29WP	2193.	29
30	225	2775.	4675.	NQODQB▼ or NQODJK▼ \$780.	NQOD430L225CU	1292.	MH44	113.	MHC44 ( )	590.	MH44WP	2603.	44
42		3077.	4940.		NQOD442L225CU	1551.	MH50	113.	MHC50 ( )	633.	MH50WP	2609.	50
42		3470.	5334.		NQOD442L225CUTFΔ	1902.	MH56	113.	MHC56 ( )	675.	MH56WP	2652.	56
54		3281.	5145.		NQOD454L225CU	1713.	MH56	113.	MHC56 ( )	675.	MH56WP	2652.	56
30	400	3605.	5502.	NQOD4▼ \$780.	NQOD430L400CU	1980.	MH65	113.	MHC65V ( )	732.	MH65WP	2742.	65
42		3782.	5655.		NQOD442L400CU	2133.	MH68	113.	MHC68V ( )	756.	MH68WP	2742.	68
42		4894.	6761.		NQOD442L600TFLΔ	3224.	MH77	113.	MHC77V ( )	777.	MH77WP	2757.	77
54		3943.	5819.		NQOD454L400CU	2282.	MH74	113.	MHC74V ( )	768.	MH74WP	2757.	74

- ▲ "CU" suffix indicates copper bussing. NQOD RTI interiors with aluminum bus are no longer available. Order the copper bussed equivalent with a "CU" suffix when ordering a replacement interior.
- Embossed mounting holes add a .25 inch standoff to back of MH box.
- ♦ Add "F" for flush, "S" for surface.
- ★ Enclosure includes trim kit.
- ▼ Select the appropriate main circuit breaker from tables starting on Digest page 7-22 and add the circuit breaker price to the total price of the panelboard.
- Δ Feed-thru lug interior.

**Table 13.23: Main Circuit Breaker Adapter Kits (Less Circuit Breaker) ▲**

Amperes	Catalog Number	Circuit Breaker Frame ■	\$ Price
225	NQODQB	QBL, QDL, QGL, QJL	780.
225	NQODJK	JDL, JGL, JJL, JLL, KIL	
400	NQOD4	LAL, LHL, Q4L	

- ▲ Select the appropriate main circuit breaker from tables starting on Digest page 7-22 and add the circuit breaker price to the total price of the panelboard.
- Circuit breaker interrupting ratings, see tables starting on Digest page 7-22.

**Table 13.24: Main Lug Interiors—Accepts plug-on and bolt-on circuit breakers**

Max. No. of Single Pole QO/QOB Circuit Breakers	Mains Rating	Total \$ Price Interior, Front and Enclosure		Interior Only (Order Branch Circuit Breakers Separately)		Type 1 Enclosure				Type 3R, 5, 12 Enclosure		Height (In.)
						Box 14 in. W x 5.75 in. D ■		Mono-Flat® Front †		Enclosure 20 in. W x 6.5 in. D		
		NEMA Type 1	NEMA Type 3R, 5, 12	Catalog No. ▲	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	
<b>14-inch Wide Cabinet—Single Phase 3-Wire</b>												
12	100	1132.	—	NQOD12L100CU	734.	NQB520	117.	NQC20 ( )	281.	Use 20-inch Wide Enclosure for Type 3R, 5, 12	20	
20		1271.	—	NQOD20L100CU	864.	NQB523	117.	NQC23 ( )	290.		23	
30		1634.	—	NQOD30L225CU	1179.	NQB532	117.	NQC32 ( )	338.		Use 20-inch Wide Enclosure for Type 3R, 5, 12	32
42	225	1882.	—	NQOD42L225CU	1418.	NQB535	117.	NQC35 ( )	347.	35		
54		2099.	—	NQOD54L225CU	1613.	NQB541	117.	NQC41 ( )	369.	41		
<b>14-inch Wide Cabinet—Three Phase 4-Wire</b>												
12	100	1267.	—	NQOD412L100CU	869.	NQB520	117.	NQC20 ( )	281.	Use 20-inch Wide Enclosure for Type 3R, 5, 12	20	
24		1469.	—	NQOD424L100CU	1062.	NQB523	117.	NQC23 ( )	290.		23	
30		1616.	—	NQOD430L100CU	1191.	NQB526	117.	NQC26 ( )	308.		26	
30	225	1747.	—	NQOD430L225CU	1292.	NQB532	117.	NQC32 ( )	338.	Use 20-inch Wide Enclosure for Type 3R, 5, 12	32	
42		2015.	—	NQOD442L225CU	1551.	NQB535	117.	NQC35 ( )	347.		35	
54		2199.	—	NQOD454L225CU	1713.	NQB541	117.	NQC41 ( )	369.		41	

- ▲ "CU" suffix indicates copper bussing. NQOD RTI interiors with aluminum bus are no longer available. Order the copper bussed equivalent with a "CU" suffix when ordering a replacement interior.
- 14-inch wide cabinets accept 100 A max. branch circuit breakers. Through feed lugs are not available in 14-in. wide enclosures.
- † Add "F" for flush, "S" for surface.

**Table 13.25: Main Circuit Breaker Interiors—Accepts Plug-On and Bolt-On Circuit Breakers**

Max. No. of One Pole QO Circuit Breakers	Mains Rating	Total \$ Price Interior, Front, Box and Adapter Kit		Main Circuit Breaker Adapter Kit		Interior Only (Order Branch Circuit Breakers Separately)		Type 1 Enclosure				Type 3R, 5, 12 Enclosure		Height (In.)
								Box 14 in. W x 5.75 in. D★		Mono-Flat Front ■		Enclosure 20 in. W x 6.5 in. D		
		NEMA Type 1	NEMA Type 3R, 5, 12	Catalog No.	\$ Price	Catalog No. ▲	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	
<b>14-inch Wide Cabinet—Single Phase 3-Wire</b>														
12	100	1688.	—	Factory Installed QOB Main Circuit Breaker	—	NQOD12M100CU	1281.	NQB523	117.	NQC23 ( )	290.	Use 20-inch Wide Enclosure for Type 3R, 5, 12	23	
20		1871.	—		—	NQOD20M100CU	1446.	NQB526	117.	NQC26 ( )	308.		26	
30		225	2481.	—	NQODJK † or NQODQB †	780.	NQOD30L225CU	1179.	NQB544	117.	NQC44 ( )		405.	Use 20-inch Wide Enclosure for Type 3R, 5, 12
42	2734.		—	NQOD42L225CU			1418.	NQB550	117.	NQC50 ( )	419.	50		
54	2984.		—	NQOD54L225CU			1613.	NQB556	117.	NQC56 ( )	474.	56		
<b>14-inch Wide Cabinet—Three Phase 4-Wire</b>														
12	100	2032.	—	Factory Installed QOB Main Circuit Breaker	—	NQOD412M100CU	1625.	NQB523	117.	NQC23 ( )	290.	Use 20-inch Wide Enclosure for Type 3R, 5, 12	23	
24		2284.	—		—	NQOD424M100CU	1859.	NQB526	117.	NQC26 ( )	308.		26	
30		2431.	—		—	NQOD430M100CU	1985.	NQB529	117.	NQC29 ( )	329.		29	
30	225	2594.	—	NQODJK † or NQODQB †	780.	NQOD430L225CU	1292.	NQB544	117.	NQC44 ( )	405.	Use 20-inch Wide Enclosure for Type 3R, 5, 12	44	
42		2867.	—			NQOD442L225CU	1551.	NQB550	117.	NQC50 ( )	419.		50	
54		3084.	—			NQOD454L225CU	1713.	NQB556	117.	NQC56 ( )	474.		56	

- ▲ "CU" suffix indicates copper bussing. NQOD RTI interiors with aluminum bus are no longer available. Order the copper bussed equivalent with a "CU" suffix when ordering a replacement interior.
- Add "F" for flush, "S" for surface.
- † Select the appropriate main circuit breaker from pages 7-24, 7-31, 7-48 and 7-49, and add the circuit breaker price to the total price of the panelboard.
- ★ 14-inch wide cabinets accept 100 A max. branch circuit breakers.

**Table 13.26: Main Circuit Breaker Adapter Kits (Less Circuit Breaker ▲)**

Amperes	Catalog No.	Circuit Breaker Frame ■	\$ Price
225	NQODQB	QBL, QDL, QGL, QJL	780.
225	NQODJK	JDL, JGL, JLL, JLL, KIL	

- ▲ Select the appropriate main circuit breaker from pages 7-24, 7-31, 7-48 and 7-49, and add the circuit breaker price to the total price of the panelboard.
- Circuit breaker interrupting ratings, see pages 7-2 through 7-9.

**NQOD 240 Vac Max.**

13 OBSOLETE PANELBOARDS

**Table 13.27: Main Lug Interiors—Accepts plug-on and bolt-on circuit breakers**

Max. No. of Single Pole QO/QOB Circuit Breakers	Mains Rating	Total Price Interior, Front and Enclosure		Main Lugs Interior Only (Order Branch Circuit Breakers Separately)		Type 1 Enclosure				Type 3R, 5, 12 Enclosure ★		Height (In.)
						Box 20"W x 5.75"D ■		MONO-FLAT® Front ♦		Enclosure 20"W x 6.5"D		
		Type 1	Type 3R, 5, 12	Catalog No. ▲	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	
<b>20" Wide Cabinet—3 Phase 4-Wire</b>												
30	100	2096.	3699.	NQOD430L100CUNL	1506.	MH29	113.	MHC29 ( )	477.	MH29WP	2193.	29
42	225	2620.	4193.	NQOD442L225CUNL	1977.	MH38	113.	MHC38 ( )	530.	MH38WP	2216.	38
42	400	3547.	5388.	NQOD442L400CUNL	2772.	MH53	113.	MHC53V ( )	662.	MH53WP	2616.	53

- ▲ "CU" suffix indicates copper bussing. NQOD RTI interiors with aluminum bus are no longer available. Order the copper bussed equivalent with a "CU" suffix when ordering a replacement interior.
- Embossed mounting holes add a .25 inch standoff to back of MH box.
- ♦ Add "F" for flush, "S" for surface.
- ★ Enclosure includes trim kit.

**Table 13.28: Main Circuit Breaker Interiors**

Max. No. of Single Pole QO/QOB Circuit Breakers	Mains Rating	Total Price Interior, Front, Box and Adapter Kit		Main Circuit Breaker Adapter Kit ▲	Main Lugs Interior Only (Order Branch Circuit Breakers Separately)		Type 1 Enclosure				Type 3R, 5, 12 Enclosure ★		Height (In.)
							Box 20"W x 5.75"D		MONO-FLAT Front ♦		Enclosure 20"W x 6.5"D		
		Type 1	Type 3R, 5, 12	Catalog No. \$ Price	Catalog No. ■	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	
<b>20" Wide Cabinet—3 Phase 4-Wire</b>													
30	100	2877.	4471.	QOB Main Circuit Breaker	NQOD430M100CUNL	2267.	MH32	113.	MHC32 ( )	497.	MH32WP	2204.	32
42	225	3503.	5366.	NQODJK NQODQB 780.	NQOD442L225CUNL	1977.	MH50	113.	MHC50 ( )	633.	MH50WP	2609.	50
42	400	4421.	6294.	NQOD4 780.	NQOD442L400CUNL	2772.	MH68	113.	MHC68V ( )	756.	MH68WP	2742.	68

- ▲ Order main circuit breaker separately
- "CU" suffix indicates copper bussing. NQOD RTI interiors with aluminum bus are no longer available. Order the copper bussed equivalent with a "CU" suffix when ordering a replacement interior.
- ♦ Add "F" for flush, "S" for surface.
- ★ Enclosure includes trim kit.

**Table 13.29: Main Circuit Breaker Adapter Kits (Less Circuit Breaker) ▲**

Amperes	Catalog Number	Circuit Breaker Frame ■	\$ Price
225	NQODQB	QBL, QDL, QGL, QJL	780.
225	NQODJK	JDL, JGL, JLL, JLL, KIL	
400	NQOD4	LAL, LHL	

- ▲ Order main circuit breaker separately
- Main neutral conductors must be copper or aluminum conductors of minimum size and quantity shown to maintain UL Listing.

**Table 13.30: NQOD Main Neutral Conductors—Required Size and Quantity ▲**

Panelboard Ampacity	Neutral Conductors Required ■	Actual Lug Wire Range
100/125	(2) 1/0 Cu or Al	(2) #4–300 kcmil
225	(2) 4/0 Cu or (2) 300 kcmil Al	(2) #4–300 kcmil
400	(4) 3/0 Cu or (4) 250 kcmil Al (2) 600 kcmil Cu (2) 750 kcmil Al	(2) 1/0–300 kcmil or (1) 750 kcmil

- ▲ Neutral conductors must be of size and quantity per table above.
- Main neutral conductors must be copper or aluminum conductors of minimum size and quantity shown to maintain UL Listing. Requirement is based on heat rise testing.

**Table 13.31: Standard Mechanical Lugs—Main Lugs**

Panel Type	Ampere Rating	Lug Wire Range▲	Wire Range Wire Bending Space per NEC Table 373-6▲
NQOD	100	(1) #10-#2/0 Cu or (1) #6-#2/0 Al	(1) #10-#1 Cu or (1) #6-#1 Al
	225	(1) #6-300 kcmil Al/Cu	(1) #6-300 kcmil Al/Cu
	400	(2) #1/0-300 kcmil Al/Cu or (1) #1/0-750 kcmil Al/Cu	(2) #1/0-300 kcmil Al/Cu or (1) #1/0-750 kcmil Al/Cu
	600	(2) #4-600 kcmil	(2) #4-500 kcmil

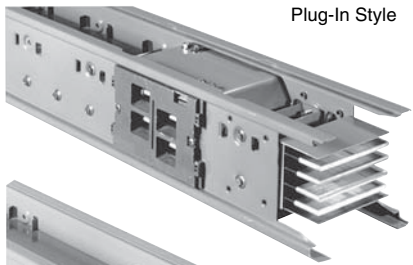
▲ (#) = Number of conductors per phase.

**Table 13.32: Standard Mechanical Lugs—Main Circuit Breaker**

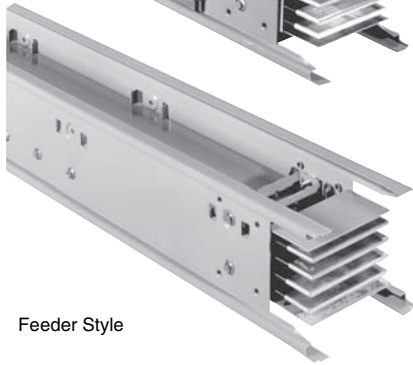
Panel Type	Ampere Rating	Circuit Breaker Type	Lug Wire Range■	Wire Range Wire Bending Space per NEC Table 373-6■
NQOD	100	QOB	(1) #4-#2/0 Al/Cu	(1) #4-#1 Al/Cu
	100	FA, FH, FI	(1) #14-#1/0 Al/Cu	(1) #14-#1 Al/Cu
	150	HD, HG, HJ, HL	(1) #14-#3/0 Al/Cu	(1) #14-#3/0 Al/Cu
	225	QB, QD, QG, QJ	(1) #4-300 kcmil Al/Cu	(1) #4-300 kcmil Al/Cu
	225	KI	(1) #6-350 kcmil Al/Cu	(1) #4-300 kcmil Al/Cu
	250	JD, JG, JJ, JL	(1) #1/0-#4/0 Al/Cu or (1) #3/0-350 kcmil Al/Cu	(1) #1/0-300 kcmil Al/Cu
	400	LA, LH	(1) #1-600 kcmil Al/Cu or (2) #1-250 kcmil Al/Cu	(1) #4-500 kcmil Al/Cu or (2) #1-250 kcmil Al/Cu
	600	MA	(3) #3/0-500 kcmil	(3) #3/0-500 kcmil

■ (#) = Number of conductors per phase.





Plug-In Style



Feeder Style

I-Line II Busway 800–5000 A pp. 14-2

**Busway Special Purpose Plug-In Units**

APD and SD Busway Plug-In Units (Not I-Line® Busway)	14-2
Capacitor and Transformer Units	14-2
Combination Switches and Contactors (For I-Line® Busway)	14-2
Ground Indicator and Neutralizer Plugs	14-2

APD and SD Busway Plug-In Units (Not I-Line® Busway)

Table 14.1: Circuit Breaker Plug-In Units

Breaker Frame	Trip Rating Amps	600 Vac 3Ø4W for use on both 3-Pole and 3Ø4W Busway		Breaker Frame	Trip Rating Amps	600 Vac 3Ø4W for use on both 3-Pole and 3Ø4W Busway	
		Catalog Number	\$ Price			Catalog Number	\$ Price
FA	15	SD75415	2966.00	LA	250	SD67428	13846.00
	20	SD75420	2966.00				
	30	SD75430	2966.00				
	40	SD75440	2966.00				
	50	SD75450	2966.00				
	60	SD75460	2966.00				
	70	SD75470	3186.00				
	100	SD75416	3186.00				
					400	SD67436	13846.00
						SD67438	13846.00
						SD67446	13846.00

Table 14.2: 100 A Busway Plug-In Unit Circuit Breaker Enclosures and Accessories

Enclosure Only (Price Circuit Breaker Separately)	1Ø3W & 3Ø4W		Ground Kit		Floor Operator Attachment	
	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
QO Breaker—70 A Enclosure	PINQO	208.00	PGKQO2	66.00	P11QO	144.00
QO Breaker/Recept—70 A Enclosure	PINQOR	324.00	PGKQOR	66.00	P11QO	144.00
FA Breaker—15-100 A Enclosure	PIN100FA	690.00	PGKFA2	66.00	P11FA	144.00

- ◊ With PIN-QO, use circuit breakers QO215H, QO220H, and QO230H. For higher ratings, use FA enclosures and circuit breakers.
- Enclosure with space for three QO circuit breaker poles and provisions for three duplex receptacles.
- ♦ Discount Schedule PE8

Capacitor and Transformer Units

Table 14.3: 3Ø Capacitor Units (Order plug-in units separately)

3Ø kVAR	240 Vac		480 Vac	
	Catalog Number	\$ Price	Catalog Number	\$ Price
2.5	—	—	PC3402	2510.00
5	PC3205	5804.00	PC3405	3752.00
7.5	PC3207	7276.00	PC3407	4566.00
10	PC3210	8470.00	PC3410	5080.00
15	PC3215	10328.00	PC3415	6098.00
20	—	—	PC3420	7620.00
25	—	—	PC3425	9478.00
30	—	—	PC3430	11206.00

Table 14.4: 1Ø Transformer Units (Order plug-in units separately)

1Ø kVA	Primary Voltage			
	240 Vac		480 Vac	
	Catalog Number	\$ Price	Catalog Number	\$ Price
1	PT2200	2394.00	PT2400	2394.00
1.5	PT2201	2574.00	PT2401	2574.00
2	PT2202	2796.00	PT2402	2796.00
3	PT2203	3312.00	PT2403	3312.00
5	PT2205	4590.00	PT2405	4590.00
7.5	PT2207	5528.00	PT2407	5528.00
10	PT2210	6370.00	PT2410	6370.00

Note: Transformer units do not plug into busway and must be used with plug-in switch, circuit breaker or cable tap box. Standard secondary voltage terminals are provided for 120 V or 240 V 1Ø2W, or 120/240, 1Ø3W connection. Specify secondary voltage if other than standard.

Note: Capacitor units do not plug into busway and must be used with plug-in switch or circuit breaker.

Combination Switches and Contactors (For I-Line® Busway)

Table 14.5: Combination Fusible Switch (3Ø4W) and Lighting Contactor ‡

Ampere Rating †	Electrically Held – 240 V		Mechanically Held – 480 V	
	\$ Price		\$ Price	
30	2802.00	3014.00		
60	3564.00	4252.00		
100	4990.00	5840.00		

- ‡ Order this device by description.
- † Lighting contactors do not include holding circuit interlock.

Table 14.6: Combination Starter/Contactor – Line Voltage – Single Speed – Non-Reversing ▲

NEMA Size	Ampere Rating	Fusible Switch (3-Pole) + G		Rating Amperes Trip	Circuit Breaker (3-Pole) + G		Add for Control Transformer
		Starter ■	Contactor		Starter ■	Contactor	
1	30	2872.00	2778.00	15–20	2950.00	2854.00	448.00
0	30	3042.00	—	—	—	—	448.00
1	60	—	2950.00	15–20	3060.00	2968.00	448.00
2	60	3828.00	—	—	—	—	636.00
2	100	—	3640.00	35–80	4396.00	4088.00	636.00

- ▲ Order this device by description. Special control features also available. Consult your nearest Schneider Electric sales office.
- Price does not include overload relay thermal units.

Ground Indicator and Neutralizer Plugs

Table 14.7: Ground Indicator and Neutralizer Plugs

240 Vac – 3-Pole		600 Vac – 3-Pole	
Catalog Number	\$ Price	Catalog Number	\$ Price
PGD3200G	1566.00	PGD3600G	1566.00

# Section 15

## Limit Switches

### Obsolete and Obsolescent Limit Switches

Miniature Enclosed Reed	9007XA	15-1
Heavy Duty, Industrial Reed Contact	9007C	15-2

### Heavy Duty, Industrial Precision and Oiltight

### Type XA

Class 9007 / Refer to Catalog 9006CT0101

#### Miniature Enclosed Reed

Type XA is designed for use in applications where contact reliability, environmental immunity, small size, or low cost are required. Sealed construction keeps contaminants out of the contact area, making it the ideal choice for low voltage, low current circuits such as Programmable Controllers. ▲

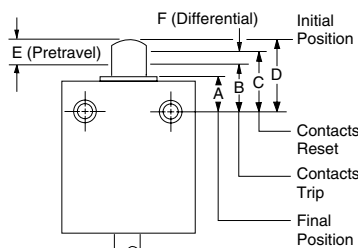
**NOTE:** Because reed switches are magnet operated, they should not be installed where strong magnetic fields may be present. The devices should always be checked for proper operation after installation.

**Table 15.1: Class 9007 Type XA**

Cable Length ■	Straight Plunger				Roller Plunger				Cross Roller Plunger			
	N.O.		N.C.		N.O.		N.C.		N.O.		N.C.	
	Type	\$ Price	Type	\$ Price	Type	\$ Price	Type	\$ Price	Type	\$ Price	Type	\$ Price
3 ft	XA7303E	96.00	XA7503E	96.00	XA7303D	114.00	XA7503D	114.00	XA7303DC	114.00	XA7503DC	114.00
6 ft	XA7306E	105.00	XA7506E	105.00	XA7306D	120.00	XA7506D	120.00	XA7306DC	120.00	XA7506DC	120.00
9 ft	XA7309E	111.00	XA7509E	111.00	XA7309D	128.00	XA7509D	128.00	XA7309DC	128.00	XA7509DC	128.00

- ▲ See the current ratings table in Section 21 of Digest 175 for contact specifications.
- Other cable lengths are available. Order by changing the last two digits of the type number to the length desired, and add \$1.50 per additional foot. Example: An XA7303E with 15 ft of cable would become an XA7315E. \$79.00 each.

#### Operating Data



	Top Push Rod (Type E)	Roller Plunger (Types D, DC)
Initial position (D)	.690 in.	1.190 in.
Trip position (B)	.620 in.	1.120 in.
Pretravel (E)	.07 in.	.07 in.
Reset position (C) max.	.655 in.	1.155 in.
Differential (F)	.015 in.	.015 in.
Final position (A)	.492 in.	.992 in.
Total stroke	.198 in.	.198 in.
Operating force (max.)	2.75 lb	2.75 lb

**Contacts:** The contact is a fully encapsulated hermetically sealed reed, suitable for controlling solid state loads as well as industrial relays. Switches can also be used as inputs to intrinsically safe systems. Use of a transient suppressor will extend life of the switch when using on heavy electrical loads.

**Type XA cannot be used in Division 2 locations** as the Type C Reed switches can, since the National Electrical Code (NEC) requires provisions for conduit connection. The Type C Reed switches have this provision for conduit and the Type XA does not.

**Enclosure Construction:** Die cast zinc-baked gray enamel finish. Meets NEMA Type 2, 4, 4X, 6P, 12 and 13 requirements. Oiltight, dusttight, watertight, and submersible.

**Cable:** SJTOWA jacketed cable with 18 gauge wire.

**Ambient Temperature Range:** -20°F (-28.9°C) to + 140°F (60°C).

**NOTE:** The XA switch is available with 3 ft of cable and 3 pin Brad Harrison male connector No. 40904 (or equivalent).

Form Y190 . . . . . **\$38.00 additional**

LIMIT SWITCHES 15

**Heavy Duty Precision Turret Head Type**

These switches can be used with standard industrial relays and starters.  
UL Listed for Class I, II and III Division 2 Groups B, C, D, F and G hazardous locations.  
They can also be used as inputs to intrinsically safe systems.

**NOTE:** Because reed switches are operated by a magnet, they should not be installed in areas where strong magnetic fields may be present. The devices should always be checked for proper operation after installation.

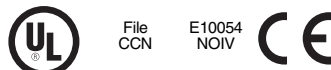
**Table 15.2: All 9007C Switches Are Rated NEMA 6P and UL Type 6P**

Select Basic Switch	Contacts	Lever Arm Type				Side Plunger Type				Plug-in	
		Standard Pre-travel Spring Return	Low Differential Spring Return	Extra Light Operating Torque Spring Return	Maintained Contact	Side Roller-Plunger Spring Return Vertical Roller Type	Side Push-Rod Plunger Spring Return	Side Push-Rod Plunger Adjustable Spring Return	Side Push-Rod Plunger Maintained Contact	Plug-in Unit without Head	Plug-in Receptacle Only
		CW & CCW▲	CW & CCW▲	CW & CCW▲	CW (Trip) CCW (Reset)						
		Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price
Standard Box Plug-in	Reed	1 N.O. C84B2 198.00	C84A2 209.00	C84N2 230.00	C84C 230.00	C84F 248.00	C84G 227.00	C84GD 234.00	C84H 258.00	▼	CT54 19.20
		1 N.C. C86B2 198.00	C86A2 209.00	C86N2 230.00	C86C 230.00	C86F 248.00	C86G 227.00	C86GD 234.00	C86H 258.00	▼	CT54 19.20
Head Only		B 43.50	A 53.00	N 72.00	C 72.00	F 87.00	G 68.00	GD 77.00	H 97.00	—	—
Nominal Operating Data	Pre-travel	13°	7°	13°	45°	0.110" (2.8 mm)			0.14" (3.6 mm)	—	—
	Total Travel	90°	90°	90°	90°	0.25" (6.3 mm)			0.25" (6.3 mm)	—	—
	Differential	7°	4°	7°	—	0.07" (1.8 mm)			—	—	—
	Reverse Overtravel	90°	90°	90°	—	—			—	—	—
	Operating Torque/Force	4 lb-in (0.45 N•m)	4 lb-in (0.45 N•m)	25 in-oz (0.08 N•m)	3 lb-in (0.34 N•m)	4 lb (0.45 N•m)			7 lb (0.80 N•m)	—	—
Repeat Accuracy—Linear travel of cam 1-1/2" (38 mm) lever arm	± 0.006" (0.15 mm)	± 0.003" (0.07 mm)	± 0.006" (0.15 mm)	± 0.006" (0.15 mm)	± 0.003" (0.07 mm)			—	—	—	

15  
LIMIT SWITCHES

Select Basic Switch	Contacts	Top Plunger Type				Wobble Stick Type					Plug-in Unit without Head	Plug-in Receptacle Only	
		Top Roller-Plunger Spring Return	Top Push-Rod Plunger Spring Return	Top Push-Rod Plunger Adjustable Spring Return	Palm Operated	Universal	Wobble Stick DELRIN Extension	Wobble Stick Wire Extension	Wobble Stick Coil Spring Extension	Cat Whisker			
		Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	Type \$ Price	
Standard Box Plug-in	Reed	1 N.O. C84D 227.00	C84E 213.00	C84ED 227.00	C84R♦ 213.00	C84JKC 198.00	C84J 213.00	C84K 213.00	C84KC 213.00	C84L 171.00	▼	CT54 19.20	
		1 N.C. C86D 227.00	C86E 213.00	C86ED 227.00	C86R♦ 213.00	C86JKC 198.00	C86J 213.00	C86K 213.00	C86KC 213.00	C86L 171.00	▼	CT54 19.20	
Head Only		D 67.00	E 58.00	ED 67.00	R♦ 58.00	JKC 43.50	J 58.00	K 58.00	KC 58.00	L 19.10	—	—	
Nominal Operating Data	Pre-travel	0.100" (2.5 mm)				13° (Any Direction)					25°	—	—
	Total Travel	0.25" (6.3 mm)				90°					90°	—	—
	Differential	0.05" (1.3 mm)				11°					18°	—	—
	Operating Torque/Force	4 lb				3 lb-in					7 in-oz	—	—
Repeat Accuracy—Linear travel of cam	± 0.003"				—					—	—	—	
▼ Plug-in Replacement Units	To order basic switch and head less the plug-in receptacle base, substitute the letters "CO" for the first "C" in the type number. <b>Example:</b> Open type replacement for Type C84B2 is type <b>CO84B2</b> .												

- ▲ These devices are factory set to operate the contacts in **both** the CW and CCW directions. **Mode of operation** is field convertible to CW only or CCW only. **To order factory converted devices**—for CCW only operation, change the "2" at the end of the type number to "1" (Example: C84B2 becomes C84B1); for CW only operation, delete the "2" at the end of the type number (Example: C84B2 becomes C84B).
- Can be converted to horizontal roller type in the field. To order horizontal roller version, add the letter "H" at the end of the equivalent vertical roller version type number (Example: C84F would become C84FH).
- ♦ Price does not include mushroom button. Must be ordered separately from Section 21 of Digest 175.
- ★ To lock the nut in the desired position, crimp the slot near the bottom of the nut.
- ▼ Plug-in units less head are not available as separate units. Order complete plug-in replacement units instead. Plug-in replacement units include the plug-in unit and head.
- △ **Wobble stick extensions** are available separately for the universal head or as replacements for complete devices. See Section 21 of Digest 175.



Acceptable Wire Sizes: 12–22 AWG  
Recommended Terminal Clamp Torque: 7 lb-in (0.80 N•m)

**Table of Contents**  
**Section 16**  
**Terminal Blocks**

**Track-Mounting Terminal Blocks & Prewired Connectors**

NEMA Style

Class 9080 Type K

16-2



**KCA1**, p. 16-2




**Fusible Terminal Block**,  
p. 16-2

**Table 16.1: Terminal Sections**



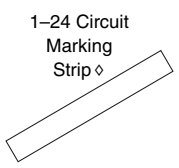




Description	Type	\$ Price ea.	Std. Pack ■
 Terminal Block Section with Pressure Wire Connectors. Wire #8–18 AWG	KC1 ▲▲	5.40	50
 Terminal Block Section with Flat Terminal. Screws are #8-32 x 1/2 in., for Ring or Spade Lugs. 15/32 in. wide maximum. Wire #10–22 AWG	KCB1 ▲▲	4.40	50
 Terminal Block Section with tin plated terminals for use with aluminum wire. Screws are #8-32 x 1/4 in., for Ring or Spade Lugs, 15/32 in. wide maximum. Wire #10–22 AWG	KCBT1 ▲	5.40	50
 Terminal Block Section with Solderless Box Lug. Wire #8–18 AWG	KCA1 ▲▲	5.40	50
 Terminal Block Section with Solderless Box Lug. Wire #4–14 AWG	KD1 ▲▲	10.40	50
 Terminal Block Section with Slip-on connectors with both sides of block. Wire #14–18 AWG▼	KCS1 ▲	7.20	50
 Terminal Block Section with Slip-on connector on one side of block and pressure wire connector on the other. Wire #8–18 AWG▼	KCPS1 ▲	9.30	50
 Fusible Terminal Block Section with Pressure Wire Connector. Wire #8–18 AWG	KH1 ▲★	19.80	50

**Table 16.2: Fusible Terminal Block Single Circuit**



	Pressure Wire Connectors Wire #10–18 AWG			
	Accepts Class H or K 30 A 250 V Fuse		Accepts Class R 30 A 250 V Fuse	
	Type	\$ Price	Type	\$ Price
	PF1□	30.50	PFR1□	30.50

- ▲ When terminal block length exceeds 12 in., guide blocks maintain terminal block rigidity.
- Orders must specify quantity listed or multiples of quantity listed.
- ◆ Includes parts required in addition to Type K1 kit when Type KH1 sections are used. KH26 End plug used only on KH1.
- ★ Price does not include fuses. Will accept any 13/32 in. dia. by 1-1/2 in. long ferrule type fuse.
- ▼ For use with 0.250 in. wide Slip-On receptacles.
- △ UL Component Recognized. File E60616, CCN XCFR2, and CSA Approved File LR62144, Class 6228 01.
- UL Listed, File E40747, CCN 120S3.
- ◇ 30 circuit when used with Type KCA1 and 20 circuits with KH1.


**Table 16.3: Assembly Kits And Components**

Description	Type	\$ Price ea.	Std. Pack ■
Assembly Kit—Includes:  1—Barrier KH21  2—End Clamps KH20  1—24 Circuit Marking Strip ◇  2—Nylon Plugs KH25  2—Guide Blocks▲ KH24	K1	25.60	1
Kit Includes:  1—Marker Strip End Plug KH26  1—Barrier KH22	KH2◆	8.00	1
White marking strip—50 in. length	MS6	4.00	5
Adhesive backed marking strip sheet—20 strips—11 in. Length	MS1	8.60	1
End clamp assembly	KH20	5.70	100
Barrier	KH21	3.40	50
Barrier (for KH1)	KH22	5.00	50
Guide blocks▲	KH24	.90	100
Nylon plug (holds in marking strip)	KH25	.90	100
End plug for Type KH1	KH26	2.70	50

**Table 16.4: Accessories**

Jumpers for Use with Type KCA1 Blocks	No. of Ckts.	Type	\$ Price ea.	Std. Pack Qty. ■
	2	JCA2	1.50	100
	6	JCA6	2.70	50

**Table 16.5: Mounting Track**

	Select the appropriate length of 9080GH1** track from Digest 175, Section 24: Terminal Blocks.
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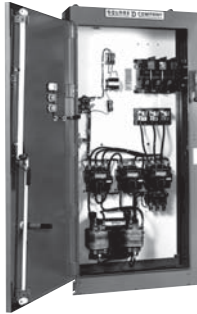
**Terminal Block Assembly Data**

To assemble one complete terminal block, the following components are required:

1. Required number of Type K – blocks. Blocks can be intermixed on same channel.
2. Parts included in Type K1 assembly kit (and KH2 kit if Type KH1 used).
3. Channel can be found in Digest 175, Section 24: Terminal Blocks.

**Table 16.6: How to Order**

To Order Specify	Catalog Number	
• Class Number	Class	Type
• Type Number	9080	KCA1



**Electro-Mechanical  
 Reduced Voltage Starter** (p. 17-2)

**Reduced Voltage Starters**

Description of All Types	17-2
How to Order	17-3

**Electromechanical Reduced Voltage Starters**

Autotransformer Starters	17-4
Wye-Delta Starters (Open Transition)	17-5
Part Winding Starters	17-7
Wye-Delta Starters (Closed Transition)	17-6
Approximate Dimensions	17-8

**Well-Guard® Pump Panel**

Reduced Voltage Type	17-9
Approximate Dimensions	17-10

## Reduced Voltage Starting of Squirrel Cage Motors

A squirrel cage motor draws high starting current (inrush) and produces high starting torque when started at full voltage. While these values differ for different motor designs, for a typical NEMA design B motor, the inrush will be approximately 600% of the motor full load amperage (FLA) rating and the starting torque will be approximately 150% of full load torque at full voltage. High current inrush and starting torque can cause problems in the electrical and mechanical systems, or may even damage the materials being processed.

When a motor is started at reduced voltage, the current at the motor terminals is reduced in direct proportion to the voltage reduction while the torque is reduced by the square of the voltage reduction. If the "typical" NEMA B motor is started at 70% of line voltage, the starting current would be 70% of the full voltage value (that is,  $0.70 \times 600\% = 420\%$  FLA). The torque would then be  $(0.70)^2$  or 49% of the normal starting torque (that is,  $0.49 \times 150\% = 74\%$  Full Load Torque). Therefore, reduced voltage starting provides an effective means of reducing both inrush current and starting torque.

If the motor has a high inertia or if the motor rating is marginal for the applied load, reducing the starting torque may prevent the motor from reaching full speed before the thermal overloads trip. Applications that require high starting torque should be reviewed to determine if reduced voltage starting is suitable.

Square D offers several types of electromechanical as well as solid state reduced voltage starters that provide different starting characteristics. The following describes the 8600 series of reduced voltage starters.

## Electromechanical Reduced Voltage Starters

### CLASS 8606—Autotransformer Starter

Autotransformer starters provide reduced voltage to the motor terminals during starting through the use of a tapped, three phase autotransformer. Taps on the autotransformer allow for selection of the motor with 50%, 65% or 80% of line voltage values supplying 50%, 65% or 80% of the current inrush seen during a full voltage start. The resulting starting torque will be 25%, 42% or 64% of full voltage values, as will be the current draw on the line. Thus, the autotransformer provides the maximum torque with minimum line current.

### CLASS 8630—Wye-Delta Starter

Wye-delta starters can only be used on wye-delta motors which have six leads that allow for motor winding to be connected in either a wye or delta configuration. During start up, the windings are connected in the wye resulting in 58% of line voltage applied across two windings. This reduces both inrush and starting torque to 33% of the delta connected values. After a set time delay, the motor leads are switched to the delta connection.

The wye-delta starter is available in both open and closed transition configurations. Closed transition starters are supplied with an additional contactor and resistor bank used to keep the motor windings energized for a few cycles until the transition from wye to delta is complete.

### CLASS 8640—Part Winding Starter

Part winding starters can only be used with part winding motors. During a part winding start, only one winding is energized, which reduces the inrush current to 60–70% (depending on the motor design) and starting torque to 50% of normal starting values with both windings energized. Most (but not all) dual voltage 230/460 volt motors are suitable for part winding starts at 230 volts.



**Table 17.1: Starter Characteristics**

Characteristic	Full Voltage	Autotransformer Class 8606	Wye-Delta Class 8630	Part Winding Class 8640	Solid State ATS46
Voltage at Motor	100%	50% / 65% / 80% (tap setting)	100%	100%	Ramped Up
Line Current (% Full Load Current)	600%	150% / 250% / 380%	200%	390%	150% to 700% (adjustable)
Starting Torque (% Rated Torque)	150%	40% / 60% / 100%	50%	70%	0% to 100% (adjustable)
Start Time (Factory Setting)	—	6–7 seconds	10 seconds / 15 seconds (open / closed transition)	1–1.5 seconds	10 seconds (adjustable 1 to 60 seconds)
Advantages	<ul style="list-style-type: none"> <li>Simple</li> <li>Economical</li> <li>High Starting Torque</li> </ul>	<ul style="list-style-type: none"> <li>High torque/Amp</li> <li>High inertial loads</li> <li>Flexibility</li> </ul>	<ul style="list-style-type: none"> <li>High inertial loads</li> <li>Long acceleration loads</li> <li>Good torque/Amp</li> </ul>	<ul style="list-style-type: none"> <li>Simple</li> <li>Small size</li> </ul>	<ul style="list-style-type: none"> <li>Greatest flexibility</li> <li>Smooth ramp</li> <li>Solid state O/L</li> <li>Diagnostics</li> </ul>
Disadvantages	<ul style="list-style-type: none"> <li>Abrupt starts</li> <li>Large current inrush</li> </ul>	<ul style="list-style-type: none"> <li>Large size</li> </ul>	<ul style="list-style-type: none"> <li>Low torque</li> <li>No flexibility</li> </ul>	<ul style="list-style-type: none"> <li>Not suitable for: High inertial loads</li> <li>Frequent starting</li> </ul>	<ul style="list-style-type: none"> <li>SCR heat dissipation</li> <li>Ambient limitations</li> </ul>
Motor	Standard	Standard	Special	Special	Standard

**How to Order**

- Specify the Class Number and the Type Number.
- If all coils are at the line voltage, and not Sizes 6 and 7 (Sizes 6 and 7 are supplied with a fused transformer with 120 Vac as standard), select the voltage code from the table below▲:

**Table 17.2: Line Voltage Codes**

Line	Control	Code
208	208	V08
240	240	V03
380	380	V05■
480	480	V06
600	600	V07

- ▲ This table is for 60 Hz; see below for codes for 50 Hz.
- See below for sizing and pricing of 380 V starters.

- If the coils are at a different voltage than line supply, or Size 6 or 7, select a voltage code from the table below♦ and also select a Form code from the table below (note that a Form code may be used with any voltage code, except as noted):

**Table 17.3: Coil Voltage Codes**

Line	Control	Code
208	120	V84
240	24★	V82
240	120	V80
480	24★	V83
480	120	V81
480	240	V87
600	120	V86
380	110/50	V95
other	specify	V99

- ♦ This table is for 60 Hz; see below for codes for 50 Hz.
- ★ 24 V coils not available on Sizes 4–7.

**Table 17.4: Form Codes**

Form Description	Form Code
Fused CPT for timing relay only	F4T
Fused CPT for all coils	F4T40★
Separate control of timing relay only	S
Separate control for all coils	Y195★

**380 Vac, 50 Hz Starters**

The Class 8600 starters are available for 380 Vac, 50 Hz applications. See table below for maximum horsepower ratings. To determine Type Number, select second digit based on NEMA Size as listed below. Select fifth digit based on horsepower requirement. Specify V05 voltage code. List prices for the same NEMA Size starter apply.

**Table 17.5: 380 Vac, 50 Hz Starters maximum Hp rating**

Autotransformer 8606		Wye-Delta 8630		Part Winding 8640	
Max. Hp	NEMA Size	Max. Hp	NEMA Size	Max. Hp	NEMA Size
25	2	15	1YD	15	1PW
50	3	40	2YD	40	2PW
75	4	75	3YD	75	3PW
150	5	150	4YD	125	4PW
300	6	250	5YD	250	5PW
		500	6YD	500	6PW

**50 Hz Control Voltage**

The starters in this section can also be operated at 50 Hz at the coil voltages listed below. For additional coil voltage availability, consult Square D/Schneider Electric CIC at 1-888-SquareD (1-888-778-2733).

**Table 17.6: Coil Voltages**

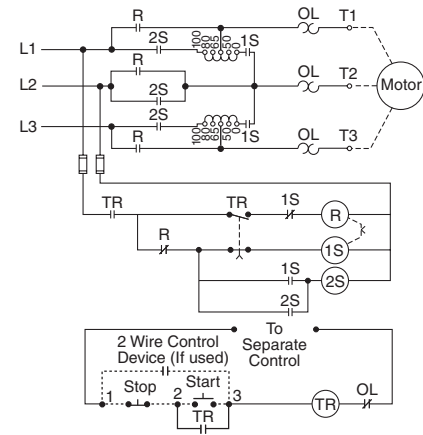
Hz	Voltage	Code	Voltage	Code	Voltage	Code	Voltage	Code
60	120	V02	240	V03	480	V06	600	V07
50	110	V02	220	V03	440	V06	550	V07

**NOTE:** Prices shown do not include thermal units. Devices require 3 thermal units (Sizes 00–6). Standard trip thermal units are \$21.50 each. See Digest page 16-125 for selection information.

**Table 17.7: 3-Pole Polyphase—600 Vac Maximum—50–60 Hz**

Motor Voltage (Starter Voltage)	Max. Hp	NEMA Size	NEMA 1 General Purpose Enclosure		NEMA 4A Watertight and Dusttight Enclosure		NEMA 12/3R* Dusttight & Driptight Industrial Use Enclosure		Open Type		O.E.M. Kit ♦	
			Type ■	\$ Price	Type ■	\$ Price	Type ■	\$ Price	Type ■	\$ Price	Type ■	\$ Price
200 (208)	10	2	SDG1C	8076.00	SDW1C	12491.00	SDA1C	10641.00	SDO1C	7734.00	SDK1C	6786.00
	15	3	SEG1D	9500.00	SEW1D	13914.00	SEA1D	13707.00	SEO1D	8418.00	SEK1D	7493.00
	20		SEG1E		SEW1E		SEA1E		SEO1E		SEK1E	
	25		SEG1F		SEW1F		SEA1F		SEO1F		SEK1F	
	30	4	SFG1G	18417.00	SFW1G	26535.00	SFA1G	21834.00	SFO1G	16848.00	SFK1G	13181.00
40	SFG1H		SFW1H		SFA1H		SFO1H		SFK1H			
50	5	SGG1J	30330.00	SGW1J	38448.00	SGA1J	34176.00	SGO1J	27167.00	SGK1J	23223.00	
75		SGG1L		SGW1L		SGA1L		SGO1L		SGK1L		
100	6	SHG1M	56507.00	SHW1M	67190.00	SHA1M	61848.00	SHO1M	51438.00	SHK1M	41481.00	
125		SHG1N		SHW1N		SHA1N		SHO1N		SHK1N		
150		SHG1P		SHW1P		SHA1P		SHO1P		SHK1P		
230 (240)	10	2	SDG1C	8076.00	SDW1C	12491.00	SDA1C	10641.00	SDO1C	7734.00	SDK1C	6786.00
	15	3	SEG1E	9500.00	SEW1E	13914.00	SEA1E	12207.00	SEO1E	8418.00	SEK1E	7493.00
	25		SEG1F		SEW1F		SEA1F		SEO1F		SEK1F	
	30		SEG1G		SEW1G		SEA1G		SEO1G		SEK1G	
	40	4	SFG1H	18417.00	SFW1H	26535.00	SFA1H	21834.00	SFO1H	16848.00	SFK1H	13181.00
	50		SFG1J		SFW1J		SFA1J		SFO1J		SFK1J	
	75	5	SGG1L	30330.00	SGW1L	38448.00	SGA1L	34176.00	SGO1L	27167.00	SGK1L	23223.00
	100		SGG1M		SGW1M		SGA1M		SGO1M		SGK1M	
	125	6	SHG1N	56507.00	SHW1N	67190.00	SHA1N	61848.00	SHO1N	51438.00	SHK1N	41481.00
	150		SHG1P		SHW1P		SHA1P		SHO1P		SHK1P	
200	SHG1Q		SHW1Q		SHA1Q		SHO1Q		SHK1Q			
250	7	SJG1R	96786.00	SJW1R	107468.00	SJA1R	102126.00	—	—	—	—	
300		SJG1S		SJW1S		SJA1S		—	—			
460 (480) / 575 (600)	10	2	SDG1C	8076.00	SDW1C	12491.00	SDA1C	10641.00	SDO1C	7734.00	SDK1C	6786.00
	15	3	SDG1D	9500.00	SDW1D	13914.00	SDA1D	12207.00	SDO1D	8418.00	SDK1D	7493.00
	20		SDG1E		SDW1E		SDA1E		SDO1E		SDK1E	
	25		SDG1F		SDW1F		SDA1F		SDO1F		SDK1F	
	30	4	SEG1G	18417.00	SEW1G	26535.00	SEA1G	21834.00	SEO1G	16848.00	SEK1G	13181.00
	40		SEG1H		SEW1H		SEA1H		SEO1H		SEK1H	
	50	5	SEG1J	30330.00	SEW1J	38448.00	SEA1J	34176.00	SEO1J	27167.00	SEK1J	23223.00
	60		SFG1K		SFW1K		SFA1K		SFO1K		SFK1K	
	75	6	SFG1L	56507.00	SFW1L	67190.00	SFA1L	61848.00	SFO1L	51438.00	SFK1L	41481.00
	100		SFG1M		SFW1M		SFA1M		SFO1M		SFK1M	
125	7	SGG1N	30330.00	SGW1N	38448.00	SGA1N	34176.00	SGO1N	27167.00	SGK1N	23223.00	
150		SGG1P		SGW1P		SGA1P		SGO1P		SGK1P		
200		SGG1Q		SGW1Q		SGA1Q		SGO1Q		SGK1Q		
250	8	SHG1R	56507.00	SHW1R	67190.00	SHA1R	61848.00	SHO1R	51438.00	SHK1R	41481.00	
300		SHG1S		SHW1S		SHA1S		SHO1S		SHK1S		
400	SHG1T	SHW1T	SHA1T	SHO1T	SHK1T	—	—					
500	9	SJG1U	96786.00	SJW1U	107468.00	SJA1U	102126.00	SJO1U	88250.00	—	—	
600		SJG1W		SJW1W		SJA1W		—		—		

- ▲ NEMA 4 Enclosures are painted sheet steel. Where required, stainless steel enclosures are available at extra cost. Specify as Form G17. See "Modifications & Forms" for price adder.
  - Both line and control voltage must be specified to order this product. See page 17-3 for the necessary codes and instructions for ordering.
  - ♦ No Factory Modifications (Forms) available with O.E.M. Kit.
  - ★ NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service entrance rated applications. See Digest page 16-104 for more information.
- Note: Class 8606 starters are supplied with a NEMA rated medium duty autotransformer. Medium duty service includes applications to motors which drive loads such as fans, pumps, compressors, line shafts, etc.
- NEMA Sizes 2-5: Autotransformer is rated for fifteen 15-second starts per hour  
 NEMA Sizes 6-7: Autotransformer is rated for three 30-second starts per hour  
 Contact Square D/Schneider Electric CIC at 1-888-SquareD (1-888-778-2733) for applications which require frequent starting or jogging, or have extremely high inertia.



Typical Autotransformer Starter  
 Sizes 2-5  
 Separate Control (Form S)

**Table 17.8: How to Order**

To Order Specify:	Catalog Number			
• Class Number	Class	Type	Voltage Code	Form(s)
• Type Number	8606	SFG1M	V81	S
• Voltage Code	Description: 100 hp, 480 V line, 120 V separate control, 60 Hz			
• Form(s) ▼				

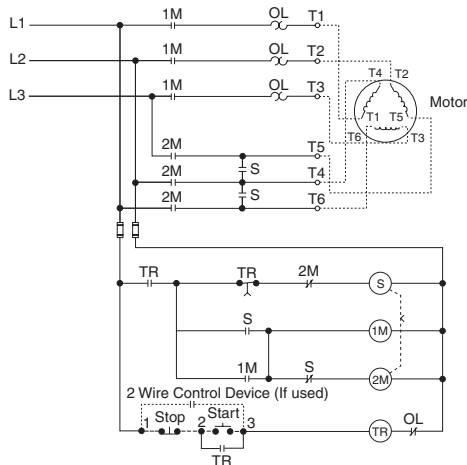
▼ Forms only need to be specified if any of the coils are at a different voltage than line supply (V8\*). See page 17-3 for a fuller explanation on how to order; this page also provides the necessary coil voltage and Form codes as well as codes for 380 V starters and 50 Hz applications. Refer to Digest pages 16-109–16-113 for other factory modifications (Forms).

**NOTE:** Prices shown do not include thermal units. Devices require 3 thermal units (Sizes 00–6). Standard trip thermal units are \$21.50 each. See Digest page 16-125 for selection information.

**Table 17.9: 3-Pole Polyphase—600 Vac Maximum—50–60 Hz**

Motor Voltage (Starter Voltage)	Max. Hp	NEMA Size	NEMA 1 General Purpose Enclosure		NEMA 4▲ Watertight and Dusttight Enclosure (Stainless Steel 1YD-4YD)		NEMA 12/3R* Dusttight & Driptight Industrial Use Enclosure		Open Type		O.E.M. Kit ♦	
			Type ■	\$ Price	Type ■e	\$ Price	Type ■	\$ Price	Type ■	\$ Price	Type ■	\$ Price
200 (208)	10	1YD	SCG1C	4892.00	SCW1C	6602.00	SCA1C	6317.00	SCO1C	4806.00	—	—
	15	2YD	SDG1D	5790.00	SDW1D	7713.00	SDA1D	7569.00	SDO1D	5562.00	—	—
	20		SDG1E		SDW1E		SDA1E		SDO1E			
	25	3YD	SEG1F	8424.00	SEW1F	11204.00	SEA1F	10562.00	SEO1F	7542.00	SEK1F	6596.00
	30		SEG1G		SEW1G		SEA1G		SEO1G		SEK1G	
	40		SEG1H		SEW1H		SEA1H		SEO1H		SEK1H	
	50	4YD	SFG1J	17568.00	SFW1J	21941.00	SFA1J	20417.00	SFO1J	15987.00	SFK1J	9300.00
	60		SFG1K		SFW1K		SFA1K		SFO1K		SFK1K	
	75	5YD	SGG1L	31584.00	SGW1L	39702.00	SGA1L	35429.00	SGO1L	28422.00	SGK1L	18530.00
	100		SGG1M		SGW1M		SGA1M		SGO1M		SGK1M	
	125		SGG1N		SGW1N		SGA1N		SGO1N		SGK1N	
	150		SGG1P		SGW1P		SGA1P		SGO1P		SGK1P	
200	6YD	SHG1Q	67589.00	SHW1Q	78272.00	SHA1Q	72930.00	SHO1Q	62519.00	SHK1Q	39347.00	
250		SHG1R		SHW1R		SHA1R		SHO1R		SHK1R		
300		SHG1S		SHW1S		SHA1S		SHO1S		SHK1S		
230 (240)	10	1YD	SCG1C	4892.00	SCW1C	6602.00	SCA1C	6317.00	SCO1C	4806.00	—	—
	15	2YD	SDG1D	5790.00	SDW1D	7713.00	SDA1D	7569.00	SDO1D	5562.00	—	—
	20		SDG1E		SDW1E		SDA1E		SDO1E			
	25	3YD	SEG1G	8424.00	SEW1G	11204.00	SEA1G	10562.00	SEO1G	7542.00	SEK1G	6596.00
	30		SEG1H		SEW1H		SEA1H		SEO1H		SEK1H	
	40		SEG1J		SEW1J		SEA1J		SEO1J		SEK1J	
	50	4YD	SFG1K	17568.00	SFW1K	21941.00	SFA1K	20417.00	SFO1K	15987.00	SFK1K	9300.00
	60		SFG1L		SFW1L		SFA1L		SFO1L		SFK1L	
	75	5YD	SGG1M	31584.00	SGW1M	39702.00	SGA1M	35429.00	SGO1M	28422.00	SGK1M	18530.00
	100		SGG1N		SGW1N		SGA1N		SGO1N		SGK1N	
	125		SGG1P		SGW1P		SGA1P		SGO1P		SGK1P	
	150		SGG1P		SGW1P		SGA1P		SGO1P		SGK1P	
200	6YD	SHG1Q	67589.00	SHW1Q	78272.00	SHA1Q	72930.00	SHO1Q	62519.00	SHK1Q	39347.00	
250		SHG1R		SHW1R		SHA1R		SHO1R		SHK1R		
300		SHG1S		SHW1S		SHA1S		SHO1S		SHK1S		
400	7YD	SJG1T	91160.00	SJW1T	101843.00	SJA1T	96501.00	SJO1T	86090.00	—	—	
500		SJG1U		SJW1U		SJA1U		SJO1U				
460- (480) / 575 (600)	10	1YD	SCG1C	4892.00	SCW1C	6602.00	SCA1C	6317.00	SCO1C	4806.00	—	—
	15	2YD	SDG1D	5790.00	SDW1D	7713.00	SDA1D	7569.00	SDO1D	5562.00	—	—
	20		SDG1E		SDW1E		SDA1E		SDO1E			
	25	3YD	SEG1F	8424.00	SEW1F	11204.00	SEA1F	10562.00	SEO1F	7542.00	SEK1F	6596.00
	30		SEG1G		SEW1G		SEA1G		SEO1G		SEK1G	
	40		SEG1H		SEW1H		SEA1H		SEO1H		SEK1H	
	50	4YD	SFG1J	17568.00	SFW1J	21941.00	SFA1J	20417.00	SFO1J	15987.00	SFK1J	9300.00
	60		SFG1K		SFW1K		SFA1K		SFO1K		SFK1K	
	75	5YD	SGG1M	31584.00	SGW1M	39702.00	SGA1M	35429.00	SGO1M	28422.00	SGK1M	18530.00
	100		SGG1N		SGW1N		SGA1N		SGO1N		SGK1N	
	125		SGG1P		SGW1P		SGA1P		SGO1P		SGK1P	
	150		SGG1P		SGW1P		SGA1P		SGO1P		SGK1P	
200	6YD	SHG1Q	67589.00	SHW1Q	78272.00	SHA1Q	72930.00	SHO1Q	62519.00	SHK1Q	39347.00	
250		SHG1R		SHW1R		SHA1R		SHO1R		SHK1R		
300		SHG1S		SHW1S		SHA1S		SHO1S		SHK1S		
400	7YD	SJG1T	91160.00	SJW1T	101843.00	SJA1T	96501.00	SJO1T	86090.00	—	—	
500		SJG1U		SJW1U		SJA1U		SJO1U				
600	7YD	SJG1Y	91160.00	SJW1Y	101843.00	SJA1Y	96501.00	SJO1Y	86090.00	—	—	
800		SJG1Z		SJW1Z		SJA1Z		SJO1Z				
1000	7YD	SJG1Z	91160.00	SJW1Z	101843.00	SJA1Z	96501.00	SJO1Z	86090.00	—	—	

- ▲ NEMA 4 Enclosures are painted sheet steel. Where required, stainless steel enclosures are available at extra cost. Specify as Form G17. See "Modifications and Forms" for price adder.
- Both line and control voltage must be specified to order this product. See page 17-3 for the necessary codes and instructions for ordering.
- ♦ No Factory Modifications (Forms) available with O.E.M. Kit.
- ★ NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service entrance rated applications. See Digest page 16-104 for more information.



Typical Wye-Delta Starter Sizes 1–4 (Open Transition)  
Common Control (Standard)

**Table 17.10: How to Order**

To Order Specify:	Catalog Number			
Class Number	Class	Type	Voltage Code	Form(s)
• Type Number	8630	SFG1M	V06	
• Voltage Code				
• Form(s)▼				
Description: 100 hp, 480 V line, 480 V common control, 60 Hz				

▼ Forms only need to be specified if any of the coils are at a different voltage than line supply (V8\*). See page 17-3 for a fuller explanation on how to order; this page also provides the necessary coil voltage and Form codes as well as codes for 380 V starters and 50 Hz applications. Refer to Digest pages 16-109–16-113 for other factory modifications (Forms).

**NOTE:** Prices shown do not include thermal units. Devices require 3 thermal units (Sizes 00–6). Standard trip thermal units are \$21.50 each. See Digest page 16-125 for selection information.

Table 17.11: 3-Pole Polyphase—600 Vac Maximum—50–60 Hz

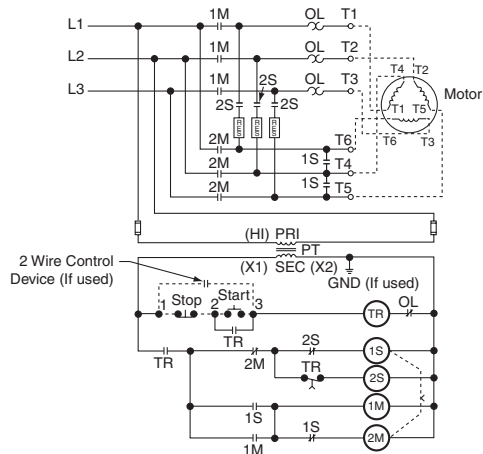
Motor Voltage (Starter Voltage)	Max. Hp	NEMA Size	NEMA 1 General Purpose Enclosure		NEMA 4* Watertight and Dusttight Enclosure (Stainless Steel 1YD-4YD)		NEMA 12/3R† Dusttight & Driptight Industrial Use Enclosure		Open Type		O.E.M. Kit ■	
			Type▲	\$ Price	Type▲	\$ Price	Type▲	\$ Price	Type▲	\$ Price	Type▲	\$ Price
200 (208)	10	1YD	SCG2C	7470.00	SCW2C	9180.00	SCA2C	8895.00	SCO2C	7385.00	—	—
	15	2YD	SDG2D	8454.00	SDW2D	10376.00	SDA2D	10233.00	SDO2D	8226.00	—	—
	20		SDG2E		SDW2E		SDA2E		SDO2E			
	25		SDG2F		SDW2F		SDA2F		SDO2F			
	30	3YD	SEG2G	11672.00	SEW2G	14450.00	SEA2G	13809.00	SEO2G	10790.00	SEK2G	10142.00
	40		SEG2H		SEW2H		SEA2H		SEO2H			
	50		SEG2J		SEW2J		SEA2J		SEO2J			
	60	4YD	SFG2K	22995.00	SFW2K	27368.00	SFA2K	25844.00	SFO2K	21414.00	SFK2K	13931.00
	75		SFG2L		SFW2L		SFA2L		SFO2L			
	100		SFG2M		SFW2M		SFA2M		SFO2M			
	125	5YD	SGG2N	38363.00	SGW2N	46481.00	SGA2N	42209.00	SGO2N	35202.00	SGK2N	25181.00
	150		SGG2P		SGW2P		SGA2P		SGO2P			
200	SGG2Q		SGW2Q		SGA2Q		SGO2Q					
250	6YD	SHG2R	85022.00	SHW2R	95702.00	SHA2R	90363.00	SHO2R	79950.00	SHK2R	50319.00	
300		SHG2S		SHW2S		SHA2S		SHO2S				
400		SHG2T		SHW2T		SHA2T		SHO2T				
500	7YD	SJG2U	118206.00	SJW2U	128888.00	SJA2U	123548.00	SJO2U	113135.00	—	—	
230 (240)	10	1YD	SCG2C	7470.00	SCW2C	9180.00	SCA2C	8895.00	SCO2C	7385.00	—	—
	15	2YD	SDG2D	8454.00	SDW2D	10376.00	SDA2D	10233.00	SDO2D	8226.00	—	—
	20		SDG2E		SDW2E		SDA2E		SDO2E			
	25		SDG2F		SDW2F		SDA2F		SDO2F			
	30	3YD	SEG2G	11672.00	SEW2G	14450.00	SEA2G	13809.00	SEO2G	10790.00	SEK2G	10142.00
	40		SEG2H		SEW2H		SEA2H		SEO2H			
	50		SEG2J		SEW2J		SEA2J		SEO2J			
	60	4YD	SFG2K	22995.00	SFW2K	27368.00	SFA2K	25844.00	SFO2K	21414.00	SFK2K	13931.00
	75		SFG2L		SFW2L		SFA2L		SFO2L			
	100		SFG2M		SFW2M		SFA2M		SFO2M			
	125	5YD	SGG2N	38363.00	SGW2N	46481.00	SGA2N	42209.00	SGO2N	35202.00	SGK2N	25181.00
	150		SGG2P		SGW2P		SGA2P		SGO2P			
200	SGG2Q		SGW2Q		SGA2Q		SGO2Q					
250	6YD	SHG2R	85022.00	SHW2R	95702.00	SHA2R	90363.00	SHO2R	79950.00	SHK2R	50319.00	
300		SHG2S		SHW2S		SHA2S		SHO2S				
400		SHG2T		SHW2T		SHA2T		SHO2T				
500	7YD	SJG2U	118206.00	SJW2U	128888.00	SJA2U	123548.00	SJO2U	113135.00	—	—	
460- (480) / 575 (600)	10	1YD	SCG2C	7470.00	SCW2C	9180.00	SCA2C	8895.00	SCO2C	7385.00	—	—
	15	2YD	SDG2D	8454.00	SDW2D	10376.00	SDA2D	10233.00	SDO2D	8226.00	—	—
	20		SDG2E		SDW2E		SDA2E		SDO2E			
	25		SDG2F		SDW2F		SDA2F		SDO2F			
	30	3YD	SEG2G	11672.00	SEW2G	14450.00	SEA2G	13809.00	SEO2G	10790.00	SEK2G	10142.00
	40		SEG2H		SEW2H		SEA2H		SEO2H			
	50		SEG2J		SEW2J		SEA2J		SEO2J			
	60	4YD	SFG2K	22995.00	SFW2K	27368.00	SFA2K	25844.00	SFO2K	21414.00	SFK2K	13931.00
	75		SFG2L		SFW2L		SFA2L		SFO2L			
	100		SFG2M		SFW2M		SFA2M		SFO2M			
	125	5YD	SGG2N	38363.00	SGW2N	46481.00	SGA2N	42209.00	SGO2N	35202.00	SGK2N	25181.00
	150		SGG2P		SGW2P		SGA2P		SGO2P			
200	SGG2Q		SGW2Q		SGA2Q		SGO2Q					
250	6YD	SHG2R	85022.00	SHW2R	95702.00	SHA2R	90363.00	SHO2R	79950.00	SHK2R	50319.00	
300		SHG2S		SHW2S		SHA2S		SHO2S				
400		SHG2T		SHW2T		SHA2T		SHO2T				
500	7YD	SJG2Y	118206.00	SJW2Y	128888.00	SJA2Y	123548.00	SJO2Y	113135.00	—	—	
700		SJG2Z		SJW2Z		SJA2Z		SJO2Z				
800		SJG2Z		SJW2Z		SJA2Z		SJO2Z				

- ▲ Both line and control voltage must be specified to order this product. See page 17-3 for the necessary codes and instructions for ordering.
- No Factory Modifications (Forms) available with O.E.M. Kit.
- ♦ NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service entrance rated applications. See Digest page 16-104 for more information.
- ★ NEMA 4 Enclosures are painted sheet steel. Where required, stainless steel enclosures are available at extra cost. Specify as Form G17. See "Modifications and Forms" for price adder.

Table 17.12: How to Order

To Order Specify:	Catalog Number			
• Class Number	Class	Type	Voltage Code	Form(s)
• Type Number	8630	SFG1M	V81	F4T40
• Voltage Code	Description: 100 hp, 480 V line, 120 V separate control, 60 Hz			
• Form(s) ▼				

▼ Forms only need to be specified if any of the coils are at a different voltage than line supply (V8\*). See page 17-3 for a fuller explanation on how to order; this page also provides the necessary coil voltage and Form codes as well as codes for 380 V starters and 50 Hz applications. Refer to Digest pages 16-109–16-113 for other factory modifications (Forms).



Typical Wye-Delta Starter  
Sizes 1–4 (Closed Transition)  
Fused Control Transformer (Form F4T40)

**NOTE:** Note that prices shown do not include thermal units. Devices require 6 thermal units (Sizes 00-6). Standard trip thermal units are \$21.50 each. See Digest page 16-125 for selection information.

17 NEMA DEFINITE PURPOSE TYPE CONTACTORS AND STARTERS

**Table 17.13: 3-Pole Polyphase—600 Vac Maximum—50–60 Hz**

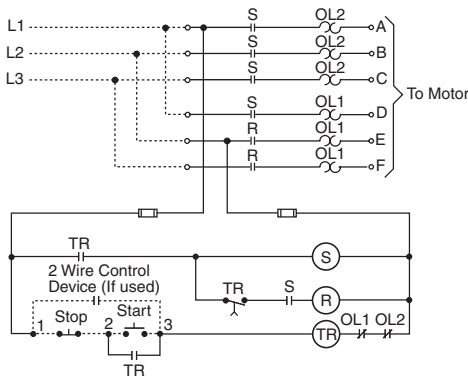
Motor Voltage (Starter Voltage)	Max. Hp	NEMA Size	NEMA 1 General Purpose Enclosure		NEMA 4▲ Watertight and Dusttight Enclosure (Stainless Steel 1PW–4PW)		NEMA 12/3R* Dusttight & Driptide Industrial Use Enclosure		Open Type		O.E.M. Kit ♦	
			Type■	\$ Price	Type■	\$ Price	Type■	\$ Price	Type■	\$ Price	Type■	\$ Price
200 (208)	10	1PW	SCG1C	3119.00	SCW1C	4829.00	SCA1C	4544.00	SC01C	3033.00	—	—
	15 20	2PW	SDG1D SDG1E	4445.00	SDW1D SDW1E	6368.00	SDA1D SDA1E	6224.00	SDO1D SDO1E	4217.00	SDK1D SDK1E	2685.00
	25 30 40	3PW	SEG1F SEG1G SEG1H	6267.00	SEW1F SEW1G SEW1H	9045.00	SEA1F SEA1G SEA1H	8405.00	SEO1F SEO1G SEO1H	5868.00	SEK1F SEK1G SEK1H	4359.00
	50 60 75	4PW	SFG1J SFG1K SFG1L	13404.00	SFW1J SFW1K SFW1L	17775.00	SFA1J SFA1K SFA1L	16253.00	SFO1J SFO1K SFO1L	12662.00	SFK1J SFK1K SFK1L	8217.00
	100 125 150	5PW	SGG1M SGG1N SGG1P	28071.00	SGW1M SGW1N SGW1P	36192.00	SGA1M SGA1N SGA1P	31919.00	SGO1M SGO1N SGO1P	26505.00	SGK1M SGK1N SGK1P	18621.00
	10	1PW	SCG1C	3119.00	SCW1C	4829.00	SCA1C	4544.00	SC01C	3033.00	—	—
230 (240)	15 20 25	2PW	SDG1D SDG1E SDG1F	4445.00	SDW1D SDW1E SDW1F	6368.00	SDA1D SDA1E SDA1F	6224.00	SDO1D SDO1E SDO1F	4217.00	SDK1D SDK1E SDK1F	2685.00
	30 40 50	3PW	SEG1G SEG1H SEG1J	6267.00	SEW1G SEW1H SEW1J	9045.00	SEA1G SEA1H SEA1J	8405.00	SEO1G SEO1H SEO1J	5868.00	SEK1G SEK1H SEK1J	4359.00
	60 75	4PW	SFG1K SFG1L	13404.00	SFW1K SFW1L	17775.00	SFA1K SFA1L	16253.00	SFO1K SFO1L	12662.00	SFK1K SFK1L	8217.00
	100 125 150	5PW	SGG1M SGG1N SGG1P	28071.00	SGW1M SGW1N SGW1P	36192.00	SGA1M SGA1N SGA1P	31919.00	SGO1M SGO1N SGO1P	26505.00	SGK1M SGK1N SGK1P	18621.00
	200 250 300	6PW	SHG1Q SHG1R SHG1S	58694.00	SHW1Q SHW1R SHW1S	67338.00	SHA1Q SHA1R SHA1S	65816.00	SHO1Q SHO1R SHO1S	53622.00	—	—
	400	7PW	SJG1T	89672.00	SJW1T	98865.00	SJA1T	98217.00	SJO1T	80699.00	—	—
460 (480) / 575 (600)	10 15	1PW	SCG1C SCG1D	3119.00	SCW1C SCW1D	4829.00	SCA1C SCA1D	4544.00	SC01C SC01D	3033.00	—	—
	20 25 30 40	2PW	SDG1E SDG1F SDG1G SDG1H	4445.00	SDW1E SDW1F SDW1G SDW1H	6368.00	SDA1E SDA1F SDA1G SDA1H	6224.00	SDO1E SDO1F SDO1G SDO1H	4217.00	SDK1E SDK1F SDK1G SDK1H	2685.00
	50 60 75	3PW	SEG1J SEG1K SEG1L	6267.00	SEW1J SEW1K SEW1L	9045.00	SEA1J SEA1K SEA1L	8405.00	SEO1J SEO1K SEO1L	5868.00	SEK1J SEK1K SEK1L	4359.00
	100 125 150	4PW	SFG1M SFG1N SFG1P	13404.00	SFW1M SFW1N SFW1P	17775.00	SFA1M SFA1N SFA1P	16253.00	SFO1M SFO1N SFO1P	12662.00	SFK1M SFK1N SFK1P	8217.00
	200 250 350	5PW	SGG1Q SGG1R SGG1S	28071.00	SGW1Q SGW1R SGW1S	36192.00	SGA1Q SGA1R SGA1S	31919.00	SGO1Q SGO1R SGO1S	26505.00	SGK1Q SGK1R SGK1S	18621.00
	400 500 600	6PW	SHG1T SHG1U SHG1W	58694.00	SHW1T SHW1U SHW1W	67338.00	SHA1T SHA1U SHA1W	65816.00	SHO1T SHO1U SHO1W	53622.00	—	—
460 (480) / 575 (600)	700 800	7PW	SJG1X SJG1Y	89672.00	SJW1X SJW1Y	98865.00	SJA1X SJA1Y	98217.00	SJO1X SJO1Y	80699.00	—	—

- ▲ NEMA 4 enclosures are painted sheet steel. Where required, stainless steel enclosures are available at extra cost. Specify as Form G17. See "Modifications and Forms" for price adder.
- Both line and control voltage must be specified to order this product. See page 17-3 for the necessary codes and instructions for ordering.
- ♦ No Factory Modifications (Forms) available with O.E.M. Kit.
- ★ NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service entrance rated applications. See Digest page 16-104 for more information.

**Table 17.14: How to Order**

To Order Specify:	Catalog Number			
• Class Number	Class	Type	Voltage Code	Form(s)
• Type Number	8640	SFG1M	V06	
• Voltage Code				
• Form(s)▼	Description: 100 hp, 480 V line, 480 V common control, 60 Hz			

▼ Forms only need to be specified if any of the coils are at a different voltage than line supply (V8\*). See page 17-3 for a fuller explanation on how to order; this page also provides the necessary coil voltage and Form codes as well as codes for 380 V starters and 50 Hz applications. Refer to Digest pages 16-109–16-113 for other factory modifications (Forms).



Typical Part Winding  
Sizes 1–4  
Common Control (Standard)



Class 8606  
Auto-transformer

Approximate Dimensions—Not for Construction

Table 17.15: Class 8606—Autotransformer

NEMA Size	Dim.	Open		NEMA 1 / 12 Enclosure				NEMA 4 Enclosure			
				Non-combo or Combo With Circuit Breaker		Combo With Disconnect Switch		Non-combo or Combo With Circuit Breaker		Combo With Disconnect Switch	
		IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
2	H	43	1092	52	1320	52	1320	52	1320	52	1320
	W	22	559	25	635	25	635	25	635	25	635
	D	8	203	10	254	10	254	10	254	10	254
3 or 4	H	63	1600	70 ■	1778	70 ■	1778	75 ■	1778	75 ■	1778
	W	28	711	32	813	32	813	32	813	32	813
	D	9	229	16	406	16	406	16	406	16	406
5	H	63	1600	70 ■	1778	90 ■	2286	75 ■	1778	95 ■	2413
	W	28	711	32	813	36	914	32	813	36	914
	D	9	229	16	406	16	406	16	406	16	406
6	H	56	1422	90 ■	2286	90 ■	2286	98 ■	2489	98 ■	2489
	W	30	762	34	864	64	1626	34	864	64	1626
	D	14	354	20	508	24	610	20	508	24	610



Class 8630  
Wye-Delta

Table 17.16: Class 8630—Wye Delta—Open Transition

NEMA Size	Dim.	Open		NEMA 1 / 12 Enclosure				NEMA 4 Enclosure			
				Non-combo		Combo		Non-combo		Combo	
		IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
1YD or 2YD	H	21	553	25	635	25	635	25	635	—	
	W	21	553	23	584	23	584	23	584	—	
	D	7	178	8	203	8	203	8	203	—	
3YD or 4YD	H	42	1067	48	1219	49	1245	48	1219	49	1245
	W	25	635	28	712	30	762	28	712	30	762
	D	7	178	8	203	11	279	8	203	11	279
5YD or 6YD	H	62	1576	90 ■	2286	90 ■	2286	98 ■	2489	98 ■	2489
	W	29	737	36	914	36	914	36	914	36	914
	D	10	254	16	406	16	406	16	406	16	406

Table 17.17: Class 8630—Wye Delta—Closed Transition

NEMA Size	Dim.	Open		NEMA 1 / 12 Enclosure				NEMA 4 Enclosure			
				Non-combo		Combo		Non-combo		Combo	
		IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
1YD or 2YD	H	21	553	25	635	25	635	25	635	—	
	W	21	553	23	584	23	584	23	584	—	
	D	14	354	16	406	16	406	16	406	—	
3YD or 4YD	H	42	1067	48	1219	49	1245	48	1219	49	1245
	W	25	635	28	712	30	762	28	712	30	762
	D	14	354	16	406	18	457	16	406	18	457
5YD or 6YD	H	80	2032	90 ■	2286	90 ■	2286	98 ■	2489	98 ■	2489
	W	30	762	36	914	36	914	36	914	36	914
	D	12	305	16	406	16	406	16	406	16	406

Table 17.18: Class 8640—Part Winding



Class 8640  
Part Winding

NEMA Size	Dim.	Open		Enclosed—NEMA 1 / 4 / 12					
				Non-combo		Combo with Circuit Breaker		Combo with Disconnect Switch	
		IN	mm	IN	mm	IN	mm	IN	mm
1PW or 2PW	H	21	553	25	635	34	853	25	635
	W	21	553	23	584	19	483	23	584
	D	6	152	8	203	11	279	8	203
3PW	H	42	1067	48	1219	44	1118	52	1321
	W	26	660	28	712	30	762	25	635
	D	7	178	8	203	12	305	11	279
4PW	H	42	1067	48	1219	44	1118	78 ■	1981
	W	26	660	28	712	30	762	32	813
	D	7	178	8	203	12	305	16	406
5PW	H	35	889	44	1118	78 ■▲	1981	78 ■▲	1981
	W	22	559	24	610	36	914	36	914
	D	10	254	12	305	16	406	16	406
6PW	H	49	1245	64	1626	—	—	90 ■	2286
	W	24	610	28	712	—	—	64	1626
	D	11	279	16	406	—	—	24	406

▲ Subtract 8" from height for Type 1 or 12 Enclosure.  
■ Free standing enclosure

For enclosure dimensions not listed, contact your nearest Square D/Schneider Electric sales office.

H = Height  
W = Width  
D = Depth

Combination Starter Form Reference

Circuit Breaker: Y791, Y7911  
Non-fusible Disc. Switch: Y792, Y7910  
Fusible Disconnect Switch: Y793-Y799  
Refer to "Factory Modifications (Forms)" section, Digest page 16-109 for complete listing of forms for combination devices.



Type VG4V06K15

Class 8940 Reduced Voltage panels in NEMA 3R enclosures are specifically designed for pumping applications. Extra space is provided for field installation of auxiliary equipment.

- Type S contactors/starters provided as standard
- All devices are UL Listed, and marked "SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT"
- Price includes Hand-Off-Auto selector switch and Start push button

**Table 17.19: Closed Transition Autotransformer Type  
3-Pole Polyphase—480 Vac Maximum (50–60 Hz)**

Note that the prices shown do not include thermal units. Overload relays are ambient temperature compensated. Devices require 3 thermal units (Sizes 2–6). Standard trip thermal units are **\$21.50** each. See Digest page 16-125 for selection information.

Motor (Starter) Volts	Max. Hp Polyphase	Coil Voltage	NEMA Size	Fusible Disconnect Type			Circuit Breaker Type		
				Fuse Clip Amperes ▲	Type■	\$ Price	Circuit Breaker	Type■	\$ Price
230 (240)	15	240–60 220–50	2	60	RD4DV03	11928.00	FAL36080	VD1DV03	11928.00
	25		3	100	RE4FV03	17055.00	FAL36100	VE1FV03	17055.00
	30			200	RE1GV03	17342.00	KAL36100	VE2GV03	17342.00
	50		4	200	RF4JV03	26657.00	KAL36200	VF1JV03	28107.00
	75			400	RG1LV03	43946.00	LAL36250	VG2LV03	43946.00
100	5	400	RG1MV03	46083.00	LAL36350	VG2MV03	46083.00		
460 (480)	25	480–60 440–50	2	60	RD2FV06	12555.00	FAL36070	VD1FV06	12555.00
	30		3	100	RE2GV06	17085.00	FAL36080	VE1GV06	17085.00
	50			100	RE2JV06	18197.00	FAL36100	VE1JV06	18197.00
	75		4	200	RF2LV06	26657.00	KAL36125	VF1LV06	27872.00
	100			200	RF2MV06	28278.00	KAL36200	VF1MV06	28278.00
	150		5	400	RG3PV06	42735.00	KAL36250	VG4PV06	46340.00
	200			400	RG3QV06	48860.00	LAL36350	VG4QV06	51237.00
	300		6	—	—	—	MAL36600	VH1SV06	79338.00
	400			—	—	—	MAL36900	VH2TV06	79338.00
	600		7	—	—	—	MAL361000	VJ1WV06	123134.00

- ▲ Fuse clips are sized for use with dual-element time-delay fuses.
- Coil voltage code must be specified to order this product. Refer to standard voltage codes shown to the left.

**Table 17.20: Part Winding Type  
3-Pole Polyphase—480 Vac Maximum (50–60 Hz)**

Note that prices shown do not include thermal units. Overload relays are ambient temperature compensated. Devices require 6 thermal units (Sizes 2–6). Standard trip thermal units are **\$21.50** each. See Digest page 16-125 for selection information.

Motor (Starter) Voltage	Max. Hp Polyphase	Coil Voltage	NEMA Size	Combination Fusible Disconnect Type			Combination Circuit Breaker Type		
				Fuse Clip (2 Sets) (A) ♦	Type★	\$ Price	Circuit Breaker (2 Bkrs.) Frame Size	Type★	\$ Price
230 (240)	25	240–60 220–50	2PW	60	MD4FV03	7536.00	FAL36070	PD1FV03	7923.00
	30		3PW	60	ME5GV03	11609.00	FAL36080	PE3GV03	11322.00
	50			100	ME6JV03	11609.00	FAL36100	PE3JV03	11322.00
	75		4PW	200	MF1LV03	21821.00	KAL36150	PF3LV03	23400.00
	100			200	MG3MV03	43326.00	KAL36175	PG2MV03	43326.00
	125		5PW	400	MG1NV03	43326.00	LAL36250	PG3NV03	43326.00
150	400	MG1PV03		43326.00	LAL36250	PG3PV03	43326.00		
460 (480)	30	480–60 440–50	2PW	30	MD5GV06	7536.00	FAL36040	PD1GV06	7293.00
	60			60	MD2HV06	7536.00	FAL36050	PD1HV06	7293.00
	40		3PW	60	ME7KV06	11609.00	FAL36070	PE3KV06	12822.00
	75			100	ME3LV06	11609.00	FAL36090	PE3LV06	11322.00
	100		4PW	200	MF3MV06	23400.00	FAL36100	PF2MV06	23400.00
	150			200	MF3PV06	23400.00	KAL36125	PF3PV06	23400.00
	200		5PW	200	MG4QV06	43326.00	KAL36175	PG2QV06	43326.00
	250			200	MG4RV06	43326.00	KAL36225	PG3RV06	43326.00
	350		400	MG2TV06	43326.00	LAL36300	PG3TV06	43326.00	

- ♦ Fuse clips are sized for use with dual-element time-delay fuses.
- ★ Coil voltage code must be specified to order this product. Refer to standard voltage codes shown below.

**Table 17.21: Coil Voltage Codes**

Voltage		Code	\$ Price Adder
60 Hz	50 Hz		
24 ▼▲	—	V01	N.C.
120▲	110	V02	N.C.
208	—	V08	N.C.
240	220	V03	N.C.
—	380	V05	N.C.
480	440	V06	N.C.
600	550	V07	N.C.
Specify	Specify	V99	35.60

- ▼ 24 V coils are not available on Sizes 4–7. On Sizes 2–3, where 24 V coils are available, **Form S** (separate control) must be specified.
- ▲ These voltage codes must include **Form S** (no charge).

For How to Order Information, see Digest page 16-12.

**Table 17.22: Part Winding—Reduced Voltage Type**

Type	Figure	A		B		C		D		E		F	
		IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
PD	3	19.00	483	34.50	876	12.25	311	13.00	330	33.50	851	.44	11
MD	3	23.00	584	25.50	648	10.60	269	17.00	432	24.50	622	.44	11
PE PF	3	30.00	762	47.00	1194	13.25	337	22.00	559	46.00	1168	.56	14
ME	3	25.00	635	52.50	1334	12.13	308	19.00	483	51.50	1308	.44	11
MF	4	36.00	914	93.00	2362	19.25	489	33.75	857	12.50	318	.69	18
PG MG	4	36.00	914	73.00	1854	19.25	489	33.75	857	12.50	318	.69	18
PH	4	38.00	965	93.00	2362	19.25	489	35.75	908	12.50	318	.69	18

**Table 17.23: Autotransformer—Reduced Voltage Type**

Type	Figure	A		B		C		D		E		F	
		IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm
RD VD	3	25.00	635	52.50	1334	11.13	283	19.00	483	51.50	1308	.44	11
RE, VE RF, VF	4	32.00	813	72.50	1842	19.25	489	29.75	756	12.50	318	.68	17
RG	4	36.00	914	93.00	2362	19.25	489	33.75	857	12.50	318	.69	17
VG	4	32.00	813	72.50	1842	19.25	489	29.75	756	12.50	318	.68	17
VH	4	34.00	864	93.00	2362	23.25	591	31.75	806	16.50	419	.69	17
VJ▲	4	64.00	1626	93.00	2362	27.25	692	61.75	1568	17.25	438	.81	21

▲ Cabinet has double doors.

**NOTE:** Illustrations may not represent the actual enclosure; they are intended for dimensional information only.

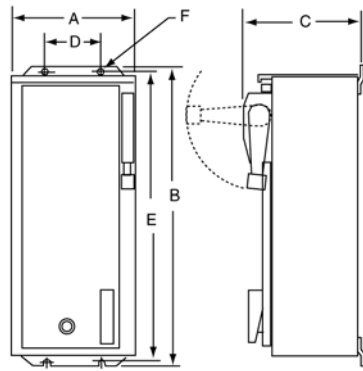


Figure 3

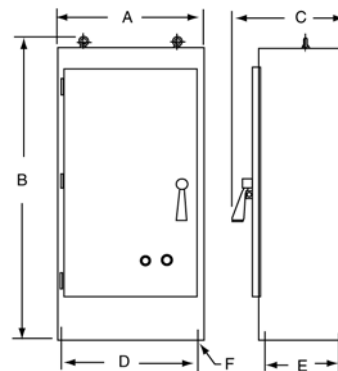


Figure 4

Dual Dimensions: **INCHES**  
Millimeters



**Table 17.24: Reduced Voltage Controllers Only**

		Classes 8606, 8630, 8640									
Factory Modifications	Enclosure Type	Form	NEMA Size							6 PW 6 YD	7 PW 7 YD
			1 PW 1 YD	2 PW 2 YD	3 PW 3 YD	4 PW 4 YD	5 PW 5 YD				
Push Buttons▲ Start-Stop	1, 4, 12	A	336.00	336.00	336.00	336.00	336.00	336.00	336.00	336.00	336.00
Selector Switches Hand-Off-Auto On-Off	1, 4, 12 1, 4, 12	C C6	336.00 336.00	336.00 336.00	336.00 336.00	336.00 336.00	336.00 336.00	336.00 336.00	336.00 336.00	336.00 336.00	336.00 336.00
Pilot Lights (specify color)■ One light ON	1, 4, 12	P	336.00	336.00	336.00	336.00	336.00	336.00	336.00	336.00	336.00
Pilot Devices in Cover and Control Circuit	Separate Control Circuit★▼ TR coil only (at control voltage)	1, 4, 12	No Charge	No Charge	No Charge	No Charge	No Charge	No Charge	No Charge	No Charge	No Charge
	All coils (at control voltage)	1, 4, 12	Y195								
Fused Control Circuit◆★▼△	One fuse	1, 4, 12	F	314.00	314.00	314.00	314.00	314.00	N/C◇	N/C◇	
	Two fuses	1, 4, 12	F4	314.00	314.00	314.00	314.00	314.00	N/C◇	N/C◇	
Reduced Voltage Controllers Only Classes 8606 8630 8640 8647 8650	Control Circuit Transformer◆★▼										
	<b>Fuses</b>										
	<b>Primary Secondary</b>										
	2— 0—	1, 4, 12	F4T	684.00	882.00	1112.00	1254.00	1395.00	N/C	N/C◇	
	2.. 1—	1, 4, 12	FF4T	1026.00	1197.00	1425.00	1566.00	1710.00	314.00	314.00	
2— 0—	1, 4, 12	F4T40	912.00	1182.00	1938.00	2079.00	3803.00	3803.00	3803.00	3803.00	
2— 1—	1, 4, 12	FF4T40	1224.00	1497.00	2250.00	2393.00	4116.00	4116.00	4116.00	4116.00	
Additional capacity (50 or 60 Hz)□	100 VA additional capacity	1, 4, 12	T11	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
	200 VA additional capacity	1, 4, 12	T12	570.00	570.00	570.00	570.00	570.00	570.00	570.00	
	300 VA additional capacity	1, 4, 12	T13	1139.00	1139.00	1139.00	1139.00	1139.00	1139.00	1139.00	
	400 VA additional capacity	1, 4, 12	T14	2421.00	2421.00	2421.00	2421.00	2421.00	2421.00	2421.00	
	500 VA additional capacity	1, 4, 12	T15	2721.00	2721.00	2721.00	2721.00	2721.00	2721.00	2721.00	
Substitute nonstandard single primary and/or voltage rating on control transformer◆	1, 4, 12	T1★	71.00	71.00	71.00	71.00	71.00	—	—		

- ▲ All push buttons are momentary contact.
- For pilot light details, refer to pilot light table on Digest page 16-109.
- ◆ See Table 17.25 below.
- ★ As standard, Reduced Voltage Controllers are supplied with common control. If **Form S** or **T** is specified, only the TR coil will be at control voltage. Specify **Form Y195** or **T40** (Ex. **Form F4T40**) if all coils must be at control voltage. Refer to page 17-3 for control circuit arrangements.
- ▼ Reduced Voltage Controllers are supplied with two control circuit fuses for conductors at line voltage. Additional fusing may be supplied if a fused control circuit transformer or separate control is specified.
- △ Must be used with Form specifying separate control (Ex. **Form FS**).
- Add Form letters and price to that of standard control transformer. (Ex. For Size 1, **Form F4T**, plus 100 VA becomes **F4T11**, \$984.00 **Form F4T40** plus 100 VA becomes **F4T41**, \$807.00).
- ◇ Size 6 and 7 controllers are supplied with **Form F4T** as standard.
- ★ Must be used with another form of **F4T**. (Ex. Standard capacity transformer required, 208–24 V. Order as **Form F4TT1**, 208–24 V.)

**Example:**

You have previously selected a Class 8606SDG1V02S. V02S means that you need a coil voltage of 120-60/110-50 wired for separate control. You would like to add **Form FF4T** with the transformer voltages being 480 volt primary, 120 volt secondary.

The new and complete class, type, voltage code and form number will be:

Class	Type	Voltage Code	Form▽
8606	SDG1	V81	FF4T

▽ Form numbers should always be shown in alphabetical order.

**Table 17.25: ◆Selection of Control Circuit Transformers**  
**The standard primary/secondary voltages for control circuit transformers are indicated in the following table.**

Voltage	Code
60 Hz (Primary–Secondary)	
120–12	V88
120–24	V89
208–120	V84
240–24	V82
240–120	V80
277–120	V85
480–24	V83
480–120	V81
480–240	V87
600–120	V86
Specify	V99

To order, select the desired device with the appropriate transformer Form designation. Then convert the previously selected voltage code (V\*\*) to reflect the desired primary/secondary voltage for the transformer. The secondary voltage should equal the previously selected coil voltage of the device. (24 Vac coils for NEMA Sizes 4–7 are not available).

**Table 17.26: Class 8606 Reduced Voltage Starters Only**

Factory Modifications	Enclosure Type	Form	NEMA Size							
			1	2	3	4	5	6	7	
Molded case thermal magnetic circuit breaker ■	1	Y791	2010.00	2451.00	2664.00	4872.00	9471.00	13944.00	18320.00	
	4	Y791	2862.00	3533.00	4886.00	7092.00	11808.00	18216.00	23601.00	
	12	Y791	2037.00	2564.00	2862.00	6579.00	10839.00	15012.00	20397.00	
Non-fusible disconnect switch	1	Y792	1340.00	1710.00	2165.00	2991.00	5355.00	—	—	
	4	Y792	2195.00	2793.00	4388.00	5327.00	7691.00	—	—	
	12	Y792	1368.00	1823.00	2366.00	4815.00	5925.00	—	—	
Automatic molded case switch	1	Y7910	—	—	—	—	—	12293.00	13004.00	
	4	Y7910	—	—	—	—	—	16565.00	17276.00	
	12	Y7910	—	—	—	—	—	13361.00	14072.00	
<b>Fusible Disconnect Switch with Fuse Clips ▲</b>										
30 A clips	1	Y793	1566.00	1566.00	—	—	—	—	—	
	4	Y793	2421.00	2124.00	—	—	—	—	—	
	12	Y793	1596.00	1596.00	—	—	—	—	—	
60 A clips	1	Y794	1566.00	1823.00	2066.00	—	—	—	—	
	4	Y794	2421.00	2885.00	3609.00	—	—	—	—	
	12	Y794	1596.00	1938.00	2280.00	—	—	—	—	
100 A clips	1	Y795	—	—	2336.00	2574.00	—	—	—	
	4	Y795	—	—	4559.00	5021.00	—	—	—	
	12	Y795	—	—	2537.00	2943.00	—	—	—	
200 A clips	1	Y796	—	—	2885.00	3596.00	—	—	—	
	4	Y796	—	—	5129.00	4340.00	—	—	—	
	12	Y796	—	—	3105.00	5327.00	—	—	—	
400 A clips	1	Y797	—	—	—	—	5868.00	11039.00	—	
	4	Y797	—	—	—	—	8190.00	15354.00	—	
	12	Y797	—	—	—	—	6438.00	12861.00	—	
Automatic Molded Case Switch with 600 A fuse clips	1	Y798	—	—	—	—	—	13802.00	—	
	4	Y798	—	—	—	—	—	18075.00	—	
	12	Y798	—	—	—	—	—	14871.00	—	
Automatic Molded Case Switch with fuse clips 1200 A or less	1	Y799	—	—	—	—	—	—	15425.00	
	4	Y799	—	—	—	—	—	—	19697.00	
	12	Y799	—	—	—	—	—	—	17562.00	

- ▲ Fuses not included.
- MAG-GARD® breakers are not supplied nor recommended.

**Table 17.27: Class 8630 Reduced Voltage Controllers Only\***

Factory Modifications	Enclosure Type	Form	NEMA Size							
			1 Wye-Delta	2 Wye-Delta	3 Wye-Delta	4 Wye-Delta	5 Wye-Delta	6 Wye-Delta	7 Wye-Delta	
Molded case thermal magnetic circuit breaker ▼	1	Y791	2451.00	1664.00	4872.00	9471.00	13944.00	18320.00	32759.00	
	4	Y791	3533.00	4886.00	7092.00	11808.00	18216.00	23601.00	37031.00	
	12	Y791	2564.00	2856.00	6579.00	10839.00	15012.00	20397.00	33827.00	
Non-fusible disconnect switch	1	Y792	1710.00	2165.00	2991.00	5355.00	—	—	—	
	4	Y792	2793.00	4388.00	5327.00	7691.00	—	—	—	
	12	Y792	1823.00	2366.00	4815.00	5925.00	—	—	—	
Automatic molded case switch	1	Y7910	—	—	—	—	12293.00	13004.00	29483.00	
	4	Y7910	—	—	—	—	16565.00	17276.00	33755.00	
	12	Y7910	—	—	—	—	13361.00	14072.00	30551.00	
<b>Fusible Disconnect Switch with Fuse Clips ◆</b>										
30 A clips	1	Y793	1823.00	1823.00	—	—	—	—	—	
	4	Y793	2421.00	3771.00	—	—	—	—	—	
	12	Y793	1938.00	1938.00	—	—	—	—	—	
60 A clips	1	Y794	1823.00	2066.00	—	—	—	—	—	
	4	Y794	2421.00	3609.00	—	—	—	—	—	
	12	Y794	1938.00	2280.00	—	—	—	—	—	
100 A clips	1	Y795	—	2336.00	2574.00	—	—	—	—	
	4	Y795	—	4559.00	5021.00	—	—	—	—	
	12	Y795	—	2537.00	2943.00	—	—	—	—	
200 A clips	1	Y796	—	—	2885.00	3596.00	—	—	—	
	4	Y796	—	—	5129.00	5840.00	—	—	—	
	12	Y796	—	—	3105.00	5327.00	—	—	—	
400 A clips	1	Y797	—	—	—	6510.00	11039.00	—	—	
	4	Y797	—	—	—	8204.00	15354.00	—	—	
	12	Y797	—	—	—	6438.00	12861.00	—	—	
Automatic Molded Case Switch with 600 A fuse clips	1	Y798	—	—	—	—	13802.00	14513.00	—	
	4	Y798	—	—	—	—	18075.00	18786.00	—	
	12	Y798	—	—	—	—	14871.00	15227.00	—	
Automatic Molded Case Switch with fuse clips 1200 A or less	1	Y799	—	—	—	—	—	15425.00	30195.00	
	4	Y799	—	—	—	—	—	19697.00	34704.00	
	12	Y799	—	—	—	—	—	17562.00	31095.00	

- ◆ Fuses not included.
- \* Wye-Delta motor starters typically have higher current ratings, per NEMA Size, than full voltage motor starters. Care must be taken in selecting the appropriate short circuit protection. The table on page 7-49 will assist in selecting proper protection based on motor full-load current.
- ▼ MAG-GARD breakers are not supplied nor recommended.

**NOTE:** To comply with Section 430-3 of the National Electrical Code®, combination part-winding starters are provided as follows:

1. Circuit Breaker: two thermal magnetic, adjustable trip circuit breakers; one for each motor winding. In the FA and KA frames, a single external operating mechanism operates the two breakers simultaneously. In KA and LA frames, each breaker has its own operating mechanism, but electrical interlocks prevent motor operation unless both breakers are closed.
2. Non-Fusible Disconnect: a single 3-pole unfused disconnect of the proper rating for both windings. The user is required to provide proper short-circuit protection external to the starter, using only Class J fuses.
3. Fusible Disconnect Switch: a single unfused disconnect with two sets of fuse clips (each set of the rating indicated) to provide short-circuit protection for each winding.

**Table 17.28: Class 8640 Reduced Voltage Starters Only**

Factory Modifications	Enclosure Type	Form	NEMA Size					
			1 PW	2 PW	3 PW	4 PW	5 PW	6 PW
Molded case thermal magnetic circuit breaker ■	1	Y7911	3014.00	3675.00	3996.00	7307.00	14207.00	—
	4	Y7911	4293.00	5300.00	7329.00	10641.00	17711.00	—
	12	Y7911	3056.00	3846.00	4293.00	9872.00	16259.00	—
<b>Fusible Disconnect Switch with Fuse Clips ▲</b>								
30 A clips (Two Sets)	1	Y7931	2006.00	2006.00	—	—	—	—
	4	Y7931	2664.00	2664.00	—	—	—	—
	12	Y7931	2132.00	2132.00	—	—	—	—
60 A clips (Two Sets)	1	Y7941	—	2273.00	2570.00	—	—	—
	4	Y7941	—	3969.00	5013.00	—	—	—
	12	Y7941	—	2507.00	2790.00	—	—	—
100 A clips (Two Sets)	1	Y7951	—	2570.00	2831.00	3176.00	—	—
	4	Y7951	—	5013.00	5525.00	5642.00	—	—
	12	Y7951	—	2790.00	3239.00	3416.00	—	—
200 A clips (Two Sets)	1	Y7961	—	—	3176.00	3959.00	6456.00	—
	4	Y7961	—	—	5642.00	6425.00	9026.00	—
	12	Y7961	—	—	3416.00	5859.00	7082.00	—
400 A clips (Two Sets)	1	Y7971	—	—	—	6456.00	15182.00 ♦	15596.00 ♦
	4	Y7971	—	—	—	9026.00	19881.00 ♦	20082.00 ♦
	12	Y7971	—	—	—	7082.00	16356.00 ♦	16592.00 ♦
Automatic molded case switch with 600 A fuse clips (Two Sets)	1	Y7920	—	—	—	—	—	15965.00
	4	Y7920	—	—	—	—	—	20664.00
	12	Y7920	—	—	—	—	—	16748.00
Automatic molded case switch with fuse clips 601–1200 A or less (Two Sets)	1	Y7921	—	—	—	—	—	16968.00
	4	Y7921	—	—	—	—	—	21668.00
	12	Y7921	—	—	—	—	—	19319.00

- ▲ Fuses not included.
- Mag-Gard® circuit breakers are not supplied nor recommended.
- ♦ Consists of automatic molded case switch with two sets of 400 A fuse clips.

**Table 17.29: Reduced Voltage Controllers Only**

		Classes 8606, 8630, 8640								
Factory Modifications		Enclosure Type	Form	NEMA Size						
				1 PW 1 YD	2 PW 2 YD	3 PW 3 YD	4 PW 4 YD	5 PW 5 YD	6 PW 6 YD	7 PW 7 YD
Overload Relays	<b>Non-Compensated Bimetallic Overload Relays</b>									
	Three Element Types SC-SD (Sizes 1 & 2)	Any	B2	57.00	57.00	—	—	—	—	—
	Types SE-SG (Sizes 3-5) Type SH (Size 6)	Any Any	B5 B2	— —	— —	57.00 —	57.00 —	57.00 —	— 57.00	— — ■
Overload Relays	<b>Ambient Compensated Bimetallic Overload Relays</b>									
	Three Element Types SC-SD (Sizes 1 & 2)	1, 4, 12	B	86.00	86.00	—	—	—	—	—
	Types SE-SF (Sizes 3 & 4) Types SG-SH (Sizes 5-6)	Any Any	Y59 B	— —	— —	107.00 —	107.00 —	— 86.00	— 86.00	— — ■
Overload Relays	<b>Overload Relays General</b>									
	Substitute 9999SO4 isolated alarm contact on melting alloy overload relay	Any	Y342	179.00	179.00	179.00	179.00	179.00	179.00	— ■
	Substitute 9999SO5 isolated alarm contact on melting alloy overload relay	Any	Y344	179.00	179.00	179.00	179.00	179.00	179.00	— ■
Overload Relays	<b>Motor Logic® Overload Relays★▼</b>									
		Any	H10	122.00	122.00	122.00	122.00	122.00	57.00	57.00
		Any	H20	122.00	122.00	122.00	122.00	122.00	57.00	57.00
Miscellaneous	Add for thermal protector Class 8606	1, 4, 12	Y116	—	570.00	570.00	570.00	570.00	570.00	—
	Coil transient suppressor Per Coil	Any	Y145	158.00	158.00	158.00	158.00	158.00	—	—
	Addition of terminal blocks (specify wired or unwired).									
	Wired, per terminal Each	1, 4, 12	G56▲	116.00	116.00	116.00	116.00	116.00	116.00	116.00
	Unwired, per terminal Each	1, 4, 12	G50▲	57.00	57.00	57.00	57.00	57.00	57.00	57.00

▲ Addition of terminal block 9080CA or 9080GR6 only. Number of circuits is same as ending of Form number. (Ex.: G505 is 5 wire terminal block.) Available in groups of 5 only. Order in increments of 5. Number of circuits is same as ending of Form number. (Ex.: G505 = 5 unwired terminals, G510 is 10 unwired terminals.)

■ Size 7 uses a solid state overload relay. See Class 8536 for complete details.

◆ NEMA 7 & 9 enclosures not available with Class 8600 devices.

★ Motor Logic overload relays are not available on Class 8640 Size 1PW to 4PW starters.

▼ See Motor Logic overload relays in the Full Voltage section on the bottom of Digest page 16-111 for additional Motor Logic overload relays option Forms.

**NOTE:** The following Conditions of Sale are subject to change. All transactions for all products sold by Square D Company, including Square D brand products and all Schneider Electric brand products, such as Merlin Gerin, Modicon and Telemecanique brand products, are subject to the latest published Conditions of Sale of the Square D Company and to any Special Conditions of Sale which may be contained in applicable Square D quotations and acknowledgments.

Square D Standard conditions of Sale will apply in all transactions between customers and Square D, unless Square D elects to use the Standard Coordinated Project Conditions of Sale. The Coordinated Project Conditions of Sale will be used on appropriate project jobs only.

**GOVERNING PROVISIONS AND ACCEPTANCE:** All quotations are subject to these conditions of sale. Acceptance of an order by Square D shall be expressly conditioned on Purchaser's assent to these conditions. Purchaser's direction to proceed with engineering, manufacture or shipment by Square D shall be deemed evidence of this assent. No modified or other conditions will be applicable unless those conditions are so stated in Square D's proposal or are specifically agreed to in writing and signed by an authorized official of Square D. Failure to object to provisions contained in any Purchase Order or other communication from the Purchaser (including, without limitation, penalty clauses of any kind) shall not be construed as a waiver of these Conditions nor an acceptance of any other provisions. These terms are a complete statement of the parties' agreement and may only be modified in writing signed by both parties. These terms may not be modified by course of dealing, course of performance or usage of trade. These terms supersede all previous written or oral quotations, statements or agreements. Any contract for sale by and between the parties shall be governed by and construed according to the laws of the State of Illinois without regard to its rules on the conflict of laws. The Convention on the International Sale of Goods is expressly excluded.

**QUOTATIONS:** Quotations shall be valid for no more than thirty (30) days from their date, unless otherwise stated in the quotation. All quotations are subject to change by Square D Company at any time upon notice to Purchaser. Quotations are made based on Square D's interpretation of the plans and specifications submitted to Square D by the Purchaser. It is Purchaser's obligation to review the quotation carefully and to immediately advise Square D of any differing interpretation Purchaser has so any necessary change can be made.

**ORDER ENTRY:** A complete, signed purchase order must be received before entry of an order into Square D's system. Considerable detail is involved in the manufacture of power equipment. To facilitate timely shipment, complete details and information, including Purchaser's requested on-site dates must be provided at the time of order entry. Shipment dates are approximate and are based upon timely receipt of all necessary information from the Purchaser. Lack of complete information may result in delays of drawings or manufacture. Such delays shall relieve Square D from compliance with the quoted delivery dates and may lead to price escalation. Failure to provide a complete signed purchase order within twenty (20) days of notification of award may result in renegotiation of price or shipment dates.

**APPROVAL DRAWINGS:** When required by a specific Purchase Order, drawings will be submitted for approval per agreed upon schedules to assure Square D has designed the equipment as described in Purchaser's specifications, as modified by Square D's quotation. If at time of drawing approval Square D has not designed the equipment to meet the specifications, as modified by Square D's quotation, Square D will make the appropriate changes at no charge to Purchaser. Where the Purchaser's specification is not definitive, Square D shall have the right to design the product in line with good commercial practice, without further obligation to Purchaser. If at drawing approval, Purchaser makes changes outside the design as stated in the specifications, such changes shall be treated as a change order as provided below.

**PRICE POLICY:** Quoted prices are firm provided: A) The order is received with complete engineering details and is released for manufacture within thirty (30) calendar days from the originally anticipated release date. B) All required approval drawings are returned and equipment released by Purchaser no later than thirty (30) calendar days from the original date of mailing of approval drawings by Square D. The returned drawings must be released for manufacture for shipment on the agreed date. Drawing re-submittals which are required for any reason other than to correct Square D errors will not extend the thirty (30) day deadline. If the Purchaser causes delay of shipment in any way or returns approval drawings beyond the time stated above, Purchaser may be subject to charges which shall not exceed 1% of the purchase order price for each full month or fraction thereof that shipment is delayed, as compensation to Square D for expenses created by such delay and not as a penalty. If shipment is delayed through the fault of Purchaser for more than 12 months from the originally anticipated release date, the price must be renegotiated.

**PRICING-PURCHASER CHANGES:** All prices cover a bill of material as described in Square D specifications or quotations to be designed and manufactured to Square D standard designs, unless otherwise agreed in writing between the parties. Purchaser may make minor changes not affecting the time or cost of performance without charge prior to the start of manufacture. If any changes are requested by the Purchaser after submission of the original Purchase Order which affect the cost or time of performance, additional billing will be made with the amount of price adder dependent on the change and status of the order when the change is made. Changes may also result in an extension of time for shipment. All changes will be agreed to by the parties, in writing, prior to implementation. Purchaser's rescheduling shipment will be considered a change. All expenses incurred by Square D in connection with the storage of equipment, including demurrage, packing, storage charges, insurance and handling charges by Square D will be paid by the Purchaser upon submission of invoices by Square D. Square D will issue price changes for any change requested by the Purchaser that affects modification of equipment, changes the bills of material, engineering or drawings or delivery schedule as follows: A) If Purchaser makes a change to an order prior to being released to engineering, the net price will be adjusted by re-pricing the equipment with prices in effect at the time of the change. A commensurate delay in the shipping date will be based on the changes involved. B) For changes made after the order is released to engineering, the net price and ship date will be adjusted as described in paragraph A above. An additional charge based on Square D standard engineering billing charges and cost of parts (\$250 minimum) will be made to cover any extra engineering and drafting, scrap or rework of parts, or cost of modification. C) If during the drawing approval process, the Purchaser makes changes outside the design covered by the specifications, Square D will be reimbursed as described in paragraph A and B above, plus any additional charges for any extra cost incurred as a direct result of the changes and allowed a commensurate delay in shipping date based on the changes involved. Changes to the order can not be processed until a formal change order is received from the Purchaser.

**SUBSTITUTION:** Square D may furnish suitable substitutes for material unobtainable because of priorities or regulations established by governmental authority or non-availability of materials from suppliers, provided such substitutions do not adversely affect the technical soundness of the equipment. Square D assumes no liability for deviation from published dimensions and descriptive information not essential to proper performance of the product.

**TAXES:** Any manufacturer's tax, retailer's tax, occupation tax, use tax, sales tax, excise tax, (except federal excise tax on vehicles), duty, customs, inspecting or testing fee, or other tax, fee or charge of any nature whatsoever, imposed by any governmental authority or measured by any transaction between Square D and Purchaser, shall be paid by the Purchaser in addition to the prices quoted or invoiced, and such charges will appear as a separate line item on the invoice. In the event Square D will be required to pay any such tax, fee, or charge, Purchaser shall reimburse Square D or, in lieu of such payment, Purchaser shall supply Square D at the time the order is submitted with an exemption certificate or other document acceptable to the tax authority. Purchase Orders must state the existence and amount of any such tax, fee or charge for which Purchaser claims an exemption.

**TERMS OF PAYMENT:** Acceptance of all Purchase Orders is subject to Purchaser meeting Square D credit standards. Terms are subject to change for failure to meet such standards. Terms are net thirty (30) days from date of invoice of each shipment, unless otherwise stated in Square D's quotation. For an authorized distributor or authorized reseller order, applicable terms of payment are stated in the quotation or applicable discount schedule. Square D reserves the right at any time to demand full or partial payment before proceeding with a contract of sale if, in its sole judgment, as a result of changes in the financial condition of the Purchaser the terms of payment originally specified are no longer justified.

**PAYMENTS:** If delivery is delayed or deferred by the Purchaser beyond the scheduled date, payment shall be due in full when Square D is prepared to ship. The equipment may be stored at the risk and expense of the Purchaser. If the Purchaser defaults when any payment is due, then the whole contract price shall become due and payable upon demand, or Square D at its option, without prejudice to other lawful remedies, may defer delivery or cancel the contract for sale. If Purchaser become insolvent, or bankrupt or in the event any proceeding is brought against the Purchaser, voluntarily or involuntarily under the bankruptcy or any insolvency law, Square D may cancel any order then outstanding at any time and recover its proper cancellation charges from the Purchaser or the Purchaser's estate.

#### **DELIVERY:**

**F.O.B. POINT OF SHIPMENT:** When the Square D quotation is based on delivery F.O.B. point of shipment, freight prepaid and allowed for delivery within the continental United States, Product is sold F.O.B. point of shipment, freight prepaid and allowed for orders over \$2000 net. Delivery by Square D to the point of shipment constitutes delivery to the Purchaser; and title and all risk of loss or damage in transit shall pass to the Purchaser at time of delivery at the F.O.B. point. Square D is not responsible for breakage or delays by carrier after having received "in good order" receipts from the carrier. Purchaser is responsible for pursuing any damage claims with the carrier. For orders under \$2000 net the above terms apply except freight is prepaid not allowed. No allowance will be made in lieu of transportation if the Purchaser accepts shipment at factory, warehouse or freight station or otherwise supplies its own transportation. Freight prepaid is defined as: a) Shipments to destinations within the continental United States to the accessible common carrier point nearest the first destination. b) Shipments to U.S. destinations outside the continental United States shall be to the common carrier free delivery point in the United States nearest the original port of embarkation. All charges associated with F.A.S., C.I.F., or other charges such as pier transfer, lift, ocean freight, and marine or war insurance shall be paid by the Purchaser, unless otherwise specifically agreed in a specific Purchase Order. In no event will Square D be responsible for demurrage or detention charges.

**DELIVERY: F.O.B. DESTINATION:** When the Square D quotation is based on delivery F.O.B. Destination, for shipments for delivery within the continental United States, Square D will retain title and all risk of loss or damage in transit to the common carrier free delivery point in the United States nearest the first destination for a price addition of 2% of the net price. If the Purchaser elects this Option, Purchaser's obligations shall be as follows: a) Purchaser shall have the responsibility of inspecting the equipment for apparent loss or damage immediately upon its arrival at the free delivery point. b) In the event of apparent shipping loss or damage, Purchaser shall make written notation of the loss on the carrier's delivery receipt and, within 72 hours of delivery shall notify the Square D Customer Information Center. Purchaser shall not remove product from the point of examination and shall retain the shipping container and packing material. Purchaser shall request the carrier to make an inspection and send Square D a copy of the carrier's inspection report. c) In the event of concealed damage which occurred during transit and is discovered by the Purchaser after delivery, Purchaser shall report such damage immediately, but in no event later than 15 days after delivery, to the delivering carrier, and within 72 hours of discovery, shall notify the local Square D field office. If such notification is not made, Square D shall not be liable for loss or damage in transit.

**SHIPMENT AND ROUTING:** Square D shall select the point of origin of shipment, the method of transportation and the routing of the shipment. Purchasers that request expedited or special modes of transportation or routing involving air, premium or any other non-standard Square D shipping shall be assessed additional charges for shipping, handling, freight and expediting. Any rebates, allowances, discounts, or incentives received by Square D from its carriers shall be retained by Square D. All prices include domestic packaging only. When other than domestic packaging is required, contact your local Square D field office. Purchaser specified packaging and marking may be subject to additional charges.

**SHORTAGES:** Claims for shortages or errors must be submitted to Square D within 30 days after invoice date, and failure to give such notice shall constitute unqualified acceptance and a waiver of all such claims by the Purchaser.

**INSTALLMENTS:** Square D reserves the right to make shipments in installments, unless otherwise expressly stipulated in a specific Purchase Order; and all such installments when separately invoiced shall be paid for when due per invoice without regard to subsequent shipments. Delay in shipment of any installment shall not relieve Purchaser of its obligation to accept remaining shipments.

**FORCE MAJEURE:** Square D shall not be liable for any damages as a result of any delays due to any causes beyond Square D's control, including, without limitation, an act of God; act of Purchaser or Square D supplier; embargo or other governmental act, regulation or request; fire; accident; strike; slowdown; flood; fuel or energy shortage; sabotage; war; riot; delay in transportation and inability to obtain necessary labor, materials or manufacturing facilities from usual sources. In the event of any such delay, the date of delivery shall be extended for a period of time reasonably necessary to overcome the effect of such delay.

**STANDARD WARRANTY:** Square D warrants equipment manufactured by it and sold through authorized sales channels to be free from defects in materials and workmanship for eighteen (18) months from date of invoice by Square D or its authorized sales channel. If within such period, any such equipment shall be proved to Square D's satisfaction to be non-conforming, such equipment shall be repaired or replaced at Square D's option. This warranty shall not apply (a) to equipment not manufactured by Square D, (b) to equipment that has been repaired or altered by other than Square D so as, in its judgment, to affect the same adversely, or (c) to equipment that has been subjected to negligence, accident, or damage by circumstances beyond Square D's control, or improper operation, maintenance or storage, or to other than normal use or service. With respect to equipment not manufactured by Square D, the warranty obligations of Square D shall in all respects conform and be limited to the warranty actually extended to Square D by its supplier. Non-conforming products must be returned at Square D's expense for evaluation unless this is waived in writing. Replacement products may be new or reconditioned. The foregoing warranties do not cover reimbursement for labor, transportation, removal, installation, temporary power, or any other expenses that may be incurred in connection with repair or replacement.

**OPTIONAL WARRANTIES:** (Only available on equipment to be located in the U.S.) Option 1-Extended-2 or 3 years from Shipment. If requested by the Purchaser and specifically accepted in writing by Square D, the standard warranty will be extended to two (2) years from date of invoice for a price addition of 1% of the net face value of the Purchase Order or will be extended for three (3) years from date of invoice for a price addition of 3% of the net face value of the Purchase Order. Option 2-Special Warranty: If requested by the Purchaser and specifically accepted in writing by Square D, the standard warranty will be extended, for a price addition of 3% of the net face value of the Purchase Order, to cover reimbursement of the direct costs of: a) Removal of non-conforming equipment or part thereof; b) Transporting equipment or parts to and from the place of repair; c) Off-loading of truck and reinstallation at the original site. Such special warranty, which may be chosen to cover a period not exceeding that of the standard or extended warranty (see above) selected, will not include the cost of providing temporary power or removing or replacing other apparatus or structures, or costs of transportation beyond a common carrier free delivery point in the continental United States. Further, the obligation of Square D for expenses and costs arising under this special warranty coverage will not exceed 50% of the net invoice price on the equipment being repaired. This warranty does not change or affect the allocation of risk or loss during shipment. Option 3-Extended Warranty-Preventative Maintenance Agreements: If requested by the Purchaser, and specifically accepted by Square D, a Preventative Maintenance Agreement is available to provide preventative maintenance on equipment covered by the agreement. Terms of the preventative maintenance agreement shall be as defined in a separate Services Agreement agreed to by the parties.

**SOFTWARE:** Any software or computer information, in whatever form, provided with equipment manufactured by Square D is licensed to Purchaser solely pursuant to standard licenses of Square D or its supplier of such software or computer information, which licenses are, hereby incorporated by reference. Square D does not warrant that such software or computer information will operate error free or without interruption, and warrants only that during the warranty period applicable to the equipment that the software will perform its essential functions. If such software or computer information fails to conform to such warranty, Square D will, at its option, provide an update to correct the non-conformance or replace the software or computer information with the latest available version containing a correction. Square D shall have no other obligation to provide updates or revisions.

**LIMITATIONS:** These disclaimers and limitations of remedies apply to all warranties offered to Purchaser and to all Purchase Orders. THE WARRANTIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES (EXCEPT WARRANTIES OF TITLE), INCLUDING, BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Except as may be expressly provided in an authorized writing by Square D, Square D shall not be subject to any other obligations or liabilities whatsoever other than as stated above with respect to equipment sold or services rendered by Square D. Notwithstanding anything to the contrary herein contained SQUARE D COMPANY, ITS CONTRACTORS AND SUPPLIERS OF ANY TIER, SHALL NOT BE LIABLE IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE FOR LOST TIME, LOST PROFITS, OR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER. The remedies of the Purchaser are exclusive and the total cumulative liability of Square D, its contractors and suppliers of any tier, with respect to this contract or anything done in connection therewith, such as the use of any product covered by or furnished under the contract, whether in contract, in tort (including negligence or strict liability) or otherwise, shall not exceed the price of the product, part, or service on which such liability is based.

**INTELLECTUAL PROPERTY:** As to equipment proposed and furnished by Square D, Square D shall defend any suit or proceeding brought against Purchaser so far as based on a claim that such equipment constitutes an infringement of any copyright, trademark or patent of the United States.

This obligation shall be effective only if Purchaser shall have made all payments then due hereunder and if Square D is notified promptly in writing and given authority, information, and assistance at Square D's expense for the defense of the same. In the event the use of such equipment by Purchaser is enjoined in such a suit, Square D shall, at its expense, and at its sole option, either (a) procure for the Purchaser the right to continue using such equipment (b) modify such equipment to render it non-infringing (c) replace such equipment with non-infringing equipment, or (d) refund the purchase price (less depreciation) and the transportation and installation costs of such equipment. Square D will not be responsible for any compromise or settlement made without its written consent. The foregoing states the entire liability of Square D for patent, trademark or copyright infringement, and in no event shall Square D be liable if any infringement charge is based on the use of Square D equipment for a purpose other than that for which it was sold by Square D. As to any equipment furnished by Square D to Purchaser and manufactured in accordance with designs proposed by Purchaser, the Purchaser shall indemnify Square D against any award made against Square D for patent, trademark, or copyright infringements.

**WITNESS OF TESTS AND FACTORY INSPECTIONS:** Normal production schedules do not provide the opportunity for Purchaser to witness routine factory tests on equipment or make factory inspections. Witnessing of tests or factory inspections by the Purchaser may result in delays of production for which Square D will not be responsible. Witness testing and factory inspections must be requested at time of quotation and confirmed at order entry. Standard Square D factory testing and inspection will apply. Square D will notify Purchaser fourteen (14) calendar days prior to scheduled witness testing or inspection. In the event Purchaser is unable to attend, the Parties may mutually agree on a rescheduled date. However, Square D, at its sole option, may consider the witness tests and/or inspection waived, and ship and invoice the Products. Purchaser will be responsible for paying for all scheduled witness testing, whether or not Purchaser attends.

**RETURN OF EQUIPMENT: NO EQUIPMENT MAY BE RETURNED WITHOUT FIRST OBTAINING SQUARE D'S WRITTEN PERMISSION AND A RETURNED MATERIAL IDENTIFICATION TAG.** Returned equipment must be of current manufacture, in the original packaging, unused, undamaged and in saleable condition, securely packed to reach Square D without damage and labeled with the return authorization number. Any cost incurred by Square D to put equipment in first class condition will be charged to the Purchaser. Returns will be credited at price invoiced by Square D less a restocking fee of 25% invoice price. Special Order and Custom equipment is not returnable. Square D shall bear the cost of returns resulting from Square D error, and method and route of return will be at the discretion of Square D. Costs incurred by failure to follow Square D direction will be borne by the Purchaser.

**NUCLEAR APPLICATIONS TERMS AND CONDITIONS:** Unless otherwise agreed in writing by a duly authorized representative of Square D, products sold hereunder are not intended for use in or in connection with any nuclear facility or activity. If so used, Square D disclaims all liability for any damage, injury or contamination; and Purchaser shall indemnify Square D against any such liability, whether arising as a result of breach of contract, warranty or tort (including negligence) or otherwise.

**PATTERNS AND TOOLS:** Notice will be given if special patterns or tools are required to complete any order. Charges for such patterns or tools do not convey title thereto or the right to remove them from Square D's plant. If patterns or tools are not used for a period of two years, Square D shall have the right to scrap them without notice.

**PRODUCT NOTICES:** Purchaser shall promptly supply the user (including its employees) of the product with all Square D supplied product notices, warnings, instructions, recommendations and similar materials.

**ERRORS:** Square D reserves the right to correct errors or omissions in quotations, acknowledgments, invoices, or other documents.

**OSHA COMPLIANCE:** Compliance with OSHA or similar federal, state or local laws during the operation or use of the product(s) is the sole responsibility of the Purchaser.

**TERMINATION:** Any order may be terminated by the Purchaser only upon written notice to Square D and upon payment of reasonable and proper termination charges based on the price of the terminated order and reimbursement of all direct costs and expenses associated with the order caused by such termination and shall include a reasonable profit. Special or custom ordered equipment is not cancelable after commencement of manufacturing.

**CANCELLATION:** Square D shall have the right to cancel any order or contract at any time by written notice for any material breach of the contract by the Purchaser, including material delays in releasing equipment for manufacture or approval drawings and excessive changes to specifications or drawings.

0100PL0043R3/07 March 31, 2007

**NOTE:** The following Conditions of Sale are subject to change. All transactions for products sold by Square D Company are subject to the latest published Conditions of Sale of the Square D Company and to any Special Conditions of Sale which may be contained in applicable Square D quotations and acknowledgments.

1. **GOVERNING PROVISIONS AND ACCEPTANCE:** All quotations are subject to these conditions of sale. Acceptance of an order by Square D shall be expressly conditioned on Purchaser's assent to these conditions. Purchaser's direction to proceed with engineering, manufacture or shipment by Square D shall be deemed evidence of this assent. No modified or other conditions will be applicable unless those conditions are so stated in Square D's proposal or are specifically agreed to in writing and signed by an authorized official of Square D. Failure to object to provisions contained in any Purchase Order or other communication from the Purchaser (including, without limitation, penalty clauses of any kind) shall not be construed as a waiver of these Conditions nor an acceptance of any other provisions. These terms are a complete statement of the parties' agreement and may only be modified in writing signed by both parties. These terms may not be modified by course of dealing, course of performance or usage of trade. These terms supersede all previous written or oral quotations, statements or agreements. Any contract for sale by and between the parties shall be governed by and construed according to the laws of the State of Illinois without regard to its rules on the conflict of laws. The Convention on the International Sale of Goods is expressly excluded.
2. **QUOTATIONS:** Quotations shall be valid for no more than thirty (30) days from their date, unless otherwise stated in the quotation. All quotations are subject to change by Square D Company at any time upon notice to Purchaser. It is Purchaser's obligation to review the quotation carefully and to immediately advise Square D of any differing interpretation Purchaser has so any necessary change can be made.
3. **PRICE POLICY:** All prices are subject to change without notice. In the event of a net price change and unless otherwise agreed to in writing, prices for orders scheduled for immediate release shall be those in effect at time of order entry. Prices for orders placed for future shipment without an agreed price and ship date will be billed at the pricing in effect as of the shipment date. All clerical errors are subject to correction.
4. **SUBSTITUTION:** Square D may furnish suitable substitutes for material unobtainable because of priorities or regulations established by governmental authority or non-availability of materials from suppliers, provided such substitutions do not adversely affect the technical soundness of the equipment. Square D assumes no liability for deviation from published dimensions and descriptive information not essential to proper performance of the product.
5. **TAXES:** Any manufacturer's tax, retailer's tax, occupation tax, use tax, sales tax, excise tax, (except federal excise tax on vehicles), duty, customs, inspecting or testing fee, or other tax, fee or charge of any nature whatsoever, imposed by any governmental authority or measured by any transaction between Square D and Purchaser, shall be paid by the Purchaser in addition to the prices quoted or invoiced, and such charges will appear as a separate line item on the invoice. In the event Square D will be required to pay any such tax, fee, or charge, Purchaser shall reimburse Square D or, in lieu of such payment, Purchaser shall supply Square D at the time the order is submitted with an exemption certificate or other document acceptable to the tax authority. Purchase Orders must state the existence and amount of any such tax, fee or charge for which Purchaser claims an exemption.
6. **TERMS OF PAYMENT:** Acceptance of all Purchase Orders is subject to Purchaser meeting Square D credit standards. Terms are subject to change for failure to meet such standards. Terms are net thirty (30) days from date of invoice of each shipment, unless otherwise stated in Square D's quotation. For an authorized distributor or authorized reseller order, applicable terms of payment are stated in the quotation or applicable discount schedule. Square D reserves the right at any time to demand full or partial payment before proceeding with a contract of sale if, in its sole judgment, as a result of changes in the financial condition of the Purchaser the terms of payment originally specified are no longer justified.
7. **PAYMENTS:** If delivery is delayed or deferred by the Purchaser beyond the scheduled date, payment shall be due in full when Square D is prepared to ship. The equipment may be stored at the risk and expense of the Purchaser. If the Purchaser defaults when any payment is due, then the whole contract price shall become due and payable upon demand, or Square D at its option, without prejudice to other lawful remedies, may defer delivery or cancel the contract for sale. If Purchaser becomes insolvent, or bankrupt or in the event any proceeding is brought against the Purchaser, voluntarily or involuntarily under the bankruptcy or any insolvency law, Square D may cancel any order outstanding at any time and recover its applicable cancellation charges from the Purchaser or the Purchaser's estate.
8. **DELIVERY:**

**A: F.O.B. POINT OF SHIPMENT:** When the Square D quotation is based on delivery F.O.B. point of shipment, freight prepaid and allowed for delivery within the continental United States, product is sold F.O.B. point of shipment, freight prepaid and allowed. A shipping and handling charge of twenty-five dollars (\$25) will be added to all orders having a total net invoice price of less than one thousand dollars (\$1,000). Delivery by Square D to the point of shipment constitutes delivery to the Purchaser; and title and all risk of loss or damage in transit shall pass to the Purchaser at time of delivery at the F.O.B. point. Square D is not responsible for breakage after having received "in good order" receipts from the carrier. Purchaser is responsible for pursuing any damage claims with the carrier. No allowance will be made in lieu of transportation if the Purchaser accepts shipment at factory, warehouse or freight station or otherwise supplies its own transportation. Freight prepaid is defined as: A) Shipments to destinations within the continental United States to the accessible common carrier point nearest the first destination. B) Shipments to U.S. destinations outside the continental United States shall be to the common carrier free delivery point in the United States nearest the original port of embarkation. All charges associated with F.A.S., C.I.F., or other charges such as pier transfer, lift, ocean freight, and marine or war insurance shall be paid by the Purchaser, unless otherwise specifically agreed in a specific Purchase Order. In no event will Square D be responsible for demurrage or detention charges.

**B: DELIVERY: F.O.B. DESTINATION:** When the Square D quotation is based on delivery F.O.B. Destination, for shipments for delivery within the continental United States, Square D will retain title and all risk of loss or damage in transit to the common carrier free delivery point in the United States nearest the first destination for a price addition of 2% of the net price. If the Purchaser elects this option, Purchaser's obligations shall be as follows: A) Purchaser shall have the responsibility of inspecting the equipment for apparent loss or damage immediately upon its arrival at the free delivery point. B) In the event of apparent shipping loss or damage, Purchaser shall make written notation of the loss on the carrier's delivery receipt and, within 72 hours of delivery shall notify the Square D Customer Information Center. Purchaser shall not remove product from the point of examination and shall retain the shipping container and packing material. Purchaser shall request the carrier to make an inspection and send Square D a copy of the carrier's inspection report. C) In the event of concealed damage which occurred during transit and is discovered by the Purchaser after delivery, Purchaser shall report such damage immediately, but in no event later than 15 days after delivery, to the delivering carrier, and within 72 hours of discovery, shall notify the local Square D field office. If such notification is not made, Square D shall not be liable for loss or damage in transit.

**C: SHIPMENT AND ROUTING:** Square D shall select the point of origin of shipment, the method of transportation and the routing of the shipment. Purchasers that request expedited or special modes of transportation or routing involving air, premium or any other non-standard Square D shipping shall be assessed additional charges for shipping, handling, freight and expediting. Any rebates, allowances, discounts or incentives received by Square D from its carriers shall be retained by Square D. All prices include domestic packaging only. When other than domestic packaging is required, contact your local Square D field office. Purchaser specified packaging and marking may be subject to additional charges.
9. **SHORTAGES:** Claims for shortages or errors must be submitted to Square D within 30 days after invoice date, and failure to give such notice shall constitute unqualified acceptance and a waiver of all such claims by the Purchaser.
10. **INSTALLMENTS:** Square D reserves the right to make shipments in installments, unless otherwise expressly stipulated in a specific Purchase Order; and all such installments when separately invoiced shall be paid for when due per invoice without regard to subsequent shipments. Delay in shipment of any installment shall not relieve Purchaser of its obligation to accept remaining shipments.
11. **FORCE MAJEURE:** Square D shall not be liable for any damages as a result of any delays due to any causes beyond Square D's control, including, without limitation, an act of God; act of Purchaser or Square D supplier; embargo or other governmental act; regulation or request; fire; accident; strike; slowdown; flood; fuel or energy shortage; sabotage; war; riot; delay in transportation and inability to obtain necessary labor, materials or manufacturing facilities from usual sources. In the event of any such delay, the date of delivery shall be extended for a period of time reasonably necessary to overcome the effect of such delay.
12. **STANDARD WARRANTY:** Square D warrants equipment manufactured by it and sold through authorized sales channels to be free from defects in materials and workmanship for eighteen (18) months from date of invoice by Square D or its authorized sales channel. If within such period any such equipment shall be proved to Square D's satisfaction to be non-conforming, such equipment shall be repaired or replaced at Square D's option. This warranty shall not apply (a) to equipment not manufactured by Square D, (b) to equipment that has been repaired or altered by other than Square D so as, in its judgment, to affect the same adversely, or (c) to equipment that has been subjected to negligence, accident, or damage by circumstances beyond Square D's control, or improper operation, maintenance or storage, or to other than normal use or service. With respect to equipment not manufactured by Square D, the warranty obligations of Square D shall in all respects conform and be limited to the warranty actually extended to Square D by its supplier. Non-conforming products must be returned at Square D's expense for evaluation unless this is waived in writing. Replacement products may be new or reconditioned. The foregoing warranties do not cover reimbursement for labor, transportation, removal, installation, temporary power, or any other expenses that may be incurred in connection with repair or replacement.

13. **OPTIONAL WARRANTIES:** (Only available on equipment to be located in the U.S.) Option 1 - Extended - 2 or 3 years from Shipment. If requested by the Purchaser and specifically accepted in writing by Square D, the standard warranty will be extended to two (2) years from date of invoice for a price addition of 1% of the net face value of the Purchase Order or will be extended for three (3) years from date of invoice for a price addition of 3% of the net face value of the Purchase Order. Option 2 - Special Warranty: If requested by the Purchaser and specifically accepted in writing by Square D, the standard warranty will be extended, for a price addition of 3% of the net face value of the Purchase Order, to cover reimbursement of the direct costs of: A) Removal of non-conforming equipment or part thereof; B) Transporting equipment or parts to and from the place of repair; C) Off-loading of truck and reinstallation at the original site. Such special warranty, which may be chosen to cover a period not exceeding that of the standard or extended warranty (see above) selected, will not include the cost of providing temporary power or removing or replacing other apparatus or structures, or costs of transportation beyond a common carrier free delivery point in the continental United States. Further, the obligation of Square D for expenses and costs arising under this special warranty coverage will not exceed 50% of the net invoice price on the equipment being repaired. This warranty does not change or affect the allocation of risk or loss during shipment. Option 3 - Extended Warranty - Preventative Maintenance Agreements: If requested by the Purchaser, and specifically accepted by Square D, a Preventative Maintenance Agreement is available to provide preventative maintenance on equipment covered by the agreement. Terms of the Preventative Maintenance Agreement shall be as defined in a separate Services Agreement agreed to by the parties.
14. **RETURN OF EQUIPMENT: NO EQUIPMENT MAY BE RETURNED WITHOUT FIRST OBTAINING SQUARE D'S WRITTEN PERMISSION AND A RETURNED MATERIAL IDENTIFICATION TAG.** Returned equipment must be of current manufacture, in the original packaging, unused, undamaged and in saleable condition. Returned equipment must be securely packed to reach Square D without damage and labeled with the return authorization number. Any cost incurred by Square D to put equipment in first class condition will be charged to the Purchaser. Returns must originate from the original purchaser account number. Returns will be credited at the original price paid as indicated on the invoice or purchase order associated to the equipment being returned as provided by the Purchaser. If no invoice number or purchase order number is provided, then credit will be issued based on the into stock price in effect 12 months prior to date of return authorization and will also have an additional 25% processing fee applied.
- Square D stocked equipment (which is defined as equipment stocked within Square D's Distribution Center) and non-stocked equipment, which are listed in the current product list as returnable and which are accepted for credit, not involving a Square D error, shall be assessed a restocking fee of 25% of the invoice price.
- NOTE:** *Special Order and Custom equipment is not returnable.*
- Each line item returned must have an extended line item value of \$25.00 or greater.
- Square D shall bear the cost of returns resulting from Square D error, and method and route of return will be at the discretion of Square D. Costs incurred by failure to follow Square D direction will be borne by the Purchaser.
15. **SOFTWARE:** Any software or computer information, in whatever form that is provided with equipment manufactured by Square D, is licensed to Purchaser solely pursuant to standard licenses of Square D or its supplier of such software or computer information which licenses are hereby incorporated by reference. Square D does not warrant that such software or computer information will operate error free or without interruption, and warrants only that during the warranty period applicable to the equipment that the software will perform its essential functions. If such software or computer information fails to conform to such warranty, Square D will, at its option, provide an update to correct the non-conformance or replace the software or computer information with the latest available version containing a correction. Square D shall have no other obligation to provide updates or revisions.
16. **LIMITATIONS:** These disclaimers and limitations of remedies apply to all warranties offered to Purchaser and to all Purchase Orders. THE WARRANTIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESSED OR IMPLIED WARRANTIES (EXCEPT WARRANTIES OF TITLE), INCLUDING, BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Except as may be expressly provided in an authorized writing by Square D, Square D shall not be subject to any other obligations or liabilities whatsoever, other than as stated above with respect to equipment sold or services rendered by Square D. Notwithstanding anything to the contrary herein contained SQUARE D COMPANY, ITS CONTRACTORS AND SUPPLIERS OF ANY TIER, SHALL NOT BE LIABLE IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE FOR LOST TIME, LOST PROFITS, OR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER. The remedies of the Purchaser are exclusive and the total cumulative liability of Square D, its contractors and suppliers of any tier, with respect to this contract or anything done in connection
- therewith, such as the use of any product covered by or furnished under the contract, whether in contract, in tort (including negligence or strict liability) or otherwise, shall not exceed the price of the product, part, or service on which such liability is based.
17. **INTELLECTUAL PROPERTY:** As to equipment proposed and furnished by Square D, Square D shall defend any suit or proceeding brought against Purchaser so far as based on a claim that such equipment constitutes an infringement of any copyright, trademark or patent of the United States. This obligation shall be effective only if Purchaser shall have made all payments then due hereunder and if Square D is notified promptly in writing and given authority, information, and assistance at Square D's expense for the defense of the same. In the event the use of such equipment by Purchaser is enjoined in such a suit, Square D shall, at its expense, and at its sole option, either (a) procure for the Purchaser the right to continue using such equipment (b) modify such equipment to render it non-infringing (c) replace such equipment with non-infringing equipment, or (d) refund the purchase price (less depreciation) and the transportation and installation costs of such equipment. Square D will not be responsible for any compromise or settlement made without its written consent. The foregoing states the entire liability of Square D for patent, trademark or copyright infringement, and in no event shall Square D be liable if any infringement charge is based on the use of Square D equipment for a purpose other than that for which it was sold by Square D. As to any equipment furnished by Square D to Purchaser and manufactured in accordance with designs proposed by Purchaser, the Purchaser shall indemnify Square D against any award made against Square D for patent, trademark, or copyright infringements.
18. **WITNESS OF TESTS AND FACTORY INSPECTIONS:** Normal production schedules do not provide the opportunity for Purchaser to witness routine factory tests on equipment or make factory inspections. Witnessing of tests or factory inspections by the Purchaser may result in delays of production for which Square D will not be responsible. Witness testing and factory inspections must be requested at time of quotation, are subject to additional costs and must be confirmed at order entry. Standard Square D factory testing and inspection will apply. Square D will notify Purchaser fourteen (14) calendar days prior to scheduled witness testing or inspection. In the event Purchaser is unable to attend, the Parties may mutually agree on a rescheduled date. However, Square D, at its sole option, may consider the witness tests and/or inspection waived, and ship and invoice the Products and the witness testing charges. Purchaser will be responsible for paying for all scheduled witness testing, whether or not Purchaser attends.
19. **NUCLEAR APPLICATIONS TERMS AND CONDITIONS:** Unless otherwise agreed in writing by a duly authorized representative of Square D, products sold hereunder are not intended for use in or in connection with any nuclear facility or activity. If so used, Square D disclaims all liability for any damage, injury or contamination; and Purchaser shall indemnify Square D against any such liability, whether arising as a result of breach of contract, warranty or tort (including negligence) or otherwise.
20. **PATTERNS AND TOOLS:** Notice will be given if special patterns or tools are required to complete any order. Charges for such patterns or tools do not convey title thereto or the right to remove them from Square D's plant. If patterns or tools are not used for a period of two years, Square D shall have the right to scrap them without notice.
21. **PRODUCT NOTICES:** Purchaser shall promptly supply the user (including its employees) of the product with all Square D supplied product notices, warnings, instructions, recommendations and similar materials.
22. **ERRORS:** Square D reserves the right to correct errors or omissions in quotations, acknowledgments, invoices, or other documents.
23. **OSHA COMPLIANCE:** Compliance with OSHA or similar federal, state or local laws during the operation or use of the product(s) is the sole responsibility of the Purchaser.
24. **TERMINATION:** Any order may be terminated by the Purchaser only upon notice to Square D and upon payment of reasonable and proper termination charges based on the price of the terminated order and reimbursement of all direct costs and expenses associated with the order caused by such termination and shall include a reasonable profit. Special or custom ordered equipment is not cancelable after final acceptance of approval drawings for the commencement of manufacturing.
25. **CANCELLATION:** Square D shall have the right to cancel any order or contract at any time by written notice for any material breach of the contract by the Purchaser, including material delays in releasing equipment for manufacture or approval drawings and excessive changes to specifications or drawings.



# Conductor Ampacity Based on the 2005 National Electrical Code®

Ampacity Based on NEC Table 310.16 – Allowable Ampacities of Insulated Conductors Rated 0 through 2000 Volts, 60° to 90°C (140° to 194°F). Not more than three current-carrying conductors in raceway or cable or earth (directly buried), based on ambient temperature of 30°C (86°F)

For conduit fill see 2005 NEC Annex C.

For Information on Temperature Ratings of Terminations to Equipment See NEC 110.14(C)

Size	Temperature Rating of Conductor. See Table 310.13.						Size
	60°C (140°F)	75°C (167°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	90°C (194°F)	
AWG kcmil	Types TW, UF	Types FEPW, RH, RHW, THHW, THW, THWN, XHHW, USE, ZW	Types TBS, SA, SIS, FEP, FEPB, MI, RHH, RHW-2, THHN, THHW, THW-2, THWN-2, USE-2, XHH, XHHW, XHHW-2, ZW-2	Types TW, UF	Types RH, RHW, THHW, THW, THWN, XHHW, USE	Types TBS, SA, SIS, THHN, THHW, THW-2, THWN-2, RHH, RHW-2, USE-2, XHH, XHHW, XHHW-2, ZW-2	AWG kcmil
	Copper			Aluminum or Copper-Clad Aluminum			
18	....	....	14	....	....	....	....
16	....	....	18	....	....	....	....
14†	20	20	25	....	....	....	....
12†	25	25	30	20	20	25	12†
10†	30	35	40	25	30	35	10†
8	40	50	55	30	40	45	8
6	55	65	75	40	50	60	6
4	70	85	95	55	65	75	4
3	85	100	110	65	75	85	3
2	95	115	130	75	90	100	2
1	110	130	150	85	100	115	1
1/0	125	150	170	100	120	135	1/0
2/0	145	175	195	115	135	150	2/0
3/0	165	200	225	130	155	175	3/0
4/0	195	230	260	150	180	205	4/0
250	215	255	290	170	205	230	250
300	240	285	320	190	230	255	300
350	260	310	350	210	250	280	350
400	280	335	380	225	270	305	400
500	320	380	430	260	310	350	500
600	355	420	475	285	340	385	600
700	385	460	520	310	375	420	700
750	400	475	535	320	385	435	750
800	410	490	555	330	395	450	800
900	435	520	585	355	425	480	900
1000	455	545	615	375	445	500	1000
1250	495	590	665	405	485	545	1250
1500	520	625	705	435	520	585	1500
1750	545	650	735	455	545	615	1750
2000	560	665	750	470	560	630	2000

## Correction Factors

Ambient Temp. °C	For ambient temperatures other than 30°C (86°F), multiply the allowable ampacities shown above by the appropriate factor shown below.						Ambient Temp. °F
21-25	1.08	1.05	1.04	1.08	1.05	1.04	70-77
26-30	1.00	1.00	1.00	1.00	1.00	1.00	78-86
31-35	.91	.94	.96	.91	.94	.96	87-95
36-40	.82	.88	.91	.82	.88	.91	96-104
41-45	.71	.82	.87	.71	.82	.87	105-113
46-50	.58	.75	.82	.58	.75	.82	114-122
51-55	.41	.67	.76	.41	.67	.76	123-131
56-60	....	.58	.71	....	.58	.71	132-140
61-70	....	.33	.58	....	.33	.58	141-158
71-80	....	....	.41	....	....	.41	159-176

† See Section 240.4 (D).

## Ratings for 120/240 volts, 3-Wire, Single-Phase Dwelling Services—

See NEC Table 310.15 (B)(6)

These are permitted ratings for Dwelling Unit service and feeder conductors which carry the total load of the dwelling.

Rating (amps)	100	110	125	150	175	200	225	250	300	350	400
Copper	4	3	2	1	1/0	2/0	3/0	4/0	250 kcmil	350 kcmil	400 kcmil
Aluminum	2	1	1/0	2/0	3/0	4/0	250 kcmil	300 kcmil	350 kcmil	500 kcmil	600 kcmil

## Adjustment Factors – See NEC Table 310.15 (B)(2)(a)

Where the number of current-carrying conductors in a raceway or cable exceeds three, the allowable ampacities shall be reduced as shown in the following table:

Number of Current-Carrying Conductors	Percent of Values in Tables as Adjusted for Ambient Temperature as Necessary
4 through 6	80
7 through 9	70
10 through 20	50
21 through 30	45
31 through 40	40
41 and Above	35

See exceptions to NEC 310.15 (B)(2).

## NEC 240.4 Protection of Conductors

Conductors, other than flexible cords and fixture wires, shall be protected against overcurrent in accordance with their ampacities specified in NEC 310.15, unless otherwise permitted or required in parts (A) through (G) of NEC 240.4.

## NEC 240.4 (D) Small Conductors

Unless specifically permitted in (E) through (G), the overcurrent protection shall not exceed 15 amperes for #14 AWG, 20 amperes for #12 AWG, and 30 amperes for #10 AWG copper; or 15 amperes for #12 AWG and 25 amperes for #10 AWG aluminum and copper-clad aluminum after any correction factors for ambient temperature and number of conductors have been applied.

## NEC 210.19 Conductors – Minimum Ampacity and Size

The branch-circuit rating shall not be less than the non-continuous load plus 125 percent of the continuous load. (See Exception for 100% rated devices)

## NEC 210.20 (A) Continuous and Noncontinuous Loads

Where a branch-circuit supplies continuous loads or any combination of continuous and noncontinuous loads, the rating of the overcurrent device shall not be less than the noncontinuous load plus 125 percent of the continuous load. (See Exception for 100% rated devices)

## NEC 430.22 (A) Single Motor Circuit Conductors

Branch-circuit conductors supplying a single motor shall have an ampacity not less than 125 percent of the motor's full-load current rating. (See Exceptions)



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